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COMMUNITY WATER SUPPLY STUDY, KANSAS CITY SMSA

BUREAU OF WATER HYGIENE, ROCKVILLE, MD.

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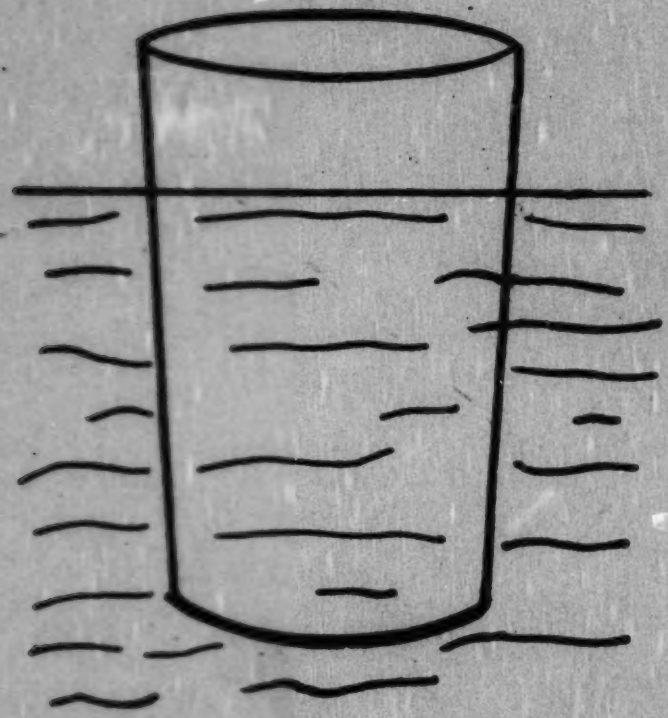
KANSAS CITY SMSA



U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
Environmental Health Service
Bureau of Water Hygiene

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I. SUMMARY OF FINDINGS AND CONCLUSIONS

Summary

In June, 1969, a survey was made of each of the 88 water supplies in the six-county Standard Metropolitan Statistical Area of Kansas City. Eighty of these are classified as community supplies and eight as special supplies. The major dependable sources of water serving the study area are the Missouri and Kansas Rivers and the "shallow wells" in the alluvium of the flood plain of these two rivers. Those using the rivers must provide extensive treatment facilities to produce safe and quality water for the consuming public. All of the well water from the alluvium is high in iron, manganese, and hardness, which also require treatment facilities to produce an acceptable water. Those towns removed from these major sources of water utilize, for the most part, small reservoirs which depend on the runoff from the annual rainfall as their source of water. These surface water supplies also require complete treatment facilities.

Thirty-six of the 88 supplies purchase their treated water from another community. Fifty supplies had treatment facilities ranging from the use of sophisticated equipment to simple chlorination and only two supplies, serving 310 people, provided no treatment. Four major supplies in the study area served 75 percent of the population connected to public water supplies. It was estimated over 97 percent of the total population in the area are served by public supplies.

In order to provide the public with a safe and quality water, it is essential that those in charge and the operators be trained and qualified. Not all of the supplies had full time operators. Forty-seven of the 88 supplies were operated on a part time basis; of these, 15 supplies, serving less than 7,000 people, purchased their treated water from another source. The operators of the major supplies are well qualified and paid a reasonable salary while, in general, the operators of the small supplies are poorly trained and paid. Thirty of the supplies pay their operator less than $2,000 per year and 22 of the operators have had no training.

Both of the State Health Departments maintain excellent programs for the bacteriological and chemical surveillance of water supplies in the study area. However, both of them have found it difficult to employ and/or hold qualified engineers and technicians in recent years. With the increased emphasis on pollution control at the national level, the staffing of the state pollution control agencies has grown to where they can more adequately meet their responsibilities. At the same time, the Kansas State Health Department's program to insure safe water supplies has not kept pace and they have been unable to provide the technical assistance and surveillance needed to adequately cope with the growing problems. Both States have voluntary water supply operators certification programs.

The survey included the collection of samples for bacteriological, chemical, radiological, and pesticide analyses. In general, the results of the analyses meet U.S. Public Health Service Drinking Water Standards. Only one

small well supply serving 280 people had poor chemical quality and two small well supplies with no treatment (serving 310 people) had bacteriological samples showing excessive coliform organism content.

The survey also revealed that very few of the supplies have an active program to detect and eliminate cross-connections. Potentially hazardous cross-connections were found in a limited survey of buildings in four areas.

The development of the various water supplies has, in many cases, been confined to the political boundaries of each of the communities. Many of the small supplies do not have a large enough economic base to provide the necessary revenue for adequate operation and maintenance. Additional planning and the implementation of these plans are needed to develop water supplies on an area or regional basis with large enough operating units to provide adequate revenue.

Some of the supplies, including one of the largest, reported problems with taste and odor. Some of the tastes and odors are attributed to naturally occurring biological conditions while others were attributed to the improper disposal of industrial wastes. Some of these problems could be corrected with improved operation while others will require additional research to find a satisfactory answer.

A total of 237 samples of finished water were collected for bacteriological analysis. While only 17 samples were positive for coliform organisms, 204 had a positive plate count for non-coliform organisms. The plate count results varied from one to 9,999 with a median value of 19 organisms per milliliter of water.

Conclusions

1. Operating Personnel

   The large supplies and some of the moderate size supplies are operated by adequately trained personnel on a full time basis and the salaries are high enough to retain the operators. However, 47 of the 88 supplies were operated on a part time basis; three-fourths of the 40 supplies serving less than 1,000 people came within this category. For all supplies, only 23 had certified operators and 22 operators had had no training. Thirty supplies paid their operator less than $2,000 per year. The quality of the operating personnel, particularly for the small supplies, is the greatest weakness in the program to provide quality and safe water to the consuming public.

2. Cross-Connection Control

   The survey revealed that very little attention is being given to the detection and elimination of cross-connections. Serious cross-connections do exist which should be eliminated. Many of the supplies have an adequate program for new installations, but very few have any program for reinspection on a routine basis.

3. Planning

Four of the 88 supplies serve 75 percent of the people in the study area. While there is an extensive interconnection of many of the supplies, there still remain 40 supplies serving a combined population of less than 19,000 people that could be either integrated into existing supplies or joined together to form an acceptable operating unit. In the past, the tendency has been to develop water supplies along the political boundaries of the individual towns and cities. Since the major sources of water are the Missouri and Kansas Rivers and the "shallow wells" in the alluvium of the flood plain of these two rivers, many of the small towns are far removed from an adequate source of water. Also, all quantity sources of water require complete treatment to produce a quality product. Past experience has shown that the small supplies usually have insufficient revenue to properly operate and maintain complete treatment facilities. Those small supplies with treatment plants do provide water of variable quality at times, and the margin of safety has been reduced.

Water service should be developed on an area or regional basis if the consuming public is to be consistently provided a safe and quality water. The Metropolitan Planning Commission (Metroplan) came into existence late in 1966; hopefully, it will be able to develop a plan to logically provide quality water service to the entire area. With the cooperation of the people, such a plan can become a reality.

4. State Programs

Both State Health Departments maintain excellent programs for the bacteriological and chemical surveillance of the water supplies in the study area. However, both of them have found it difficult to employ and hold qualified engineers and technicians in recent years. With the increased emphasis on pollution control at the national level, the staffing of the State pollution control agencies has grown with their increased responsibilities. At the same time, there has been an increase in the population and industrialization of the area. With this growth, there has been an increase in the public health problems associated with water supply development. The growth of the State Health Departments' programs to insure safe water has not kept pace with these additional problems. The resources allotted to the water programs must be increased if the States are to provide the training, technical assistance, and surveillance activities required to insure quality and safe water service to the consuming public. Even the major supplies with their competent staffs need assistance from the State agencies. The jurisdiction of the four supplies using river water is limited to their political boundaries. The public health hazards from industrial, agricultural, and municipal activities above their intake structures can only be controlled at the State level.

The certification of water supply operators is only a voluntary program in both States.

5. National Needs

The control of tastes and odors is a complex problem. Although the waterworks industry has given considerable attention to control measures, no completely satisfactory answer has been found. There is a need for a continuous monitoring system to detect taste and odor problems, alert the operator, and provide sufficient data to determine the treatment measures required. Another monitoring system is also needed for the finished water leaving the treatment plant. The research required to develop the system for taste and odor detection is compatible with the needs of the finished water monitor.

Some of the complex compounds found in industrial wastes are being detected in the raw water being treated in water plants. With the increased emphasis on air pollution control, many of the liquid wastes are now being placed in landfills instead of being burned. The seepage from improperly designed and operated landfills is another possible source of objectionable compounds to be found in raw water. Also, the explosive growth of the cattle feedlot industry has created a new pollution problem that needs to be solved. The diseases transmitted to man from the feedlot waste discharges are largely unknown. Also, research is needed to determine the toxic and long term effect from complex chemicals upon the health of man.

Very few coliform organisms were found in the samples collected from the distribution systems; this is good and demonstrates the effectiveness of the State programs. However, a high percentage of the samples had a plate count indicating the presence of non-coliform organisms. No known public health evaluation has been made of these organisms. Some food processing plants have had difficulty with high plate counts in their finished products. In some cases, the public water supply has been blamed for the high plate counts.

Until recent years, the Public Health Service provided training courses pertaining to new and complicated laboratory procedures and/or processes for State and local waterworks personnel. These courses have been curtailed although the need still exists.

6. Water Quality

In general, very few of the wet chemistry analyses exceeded the recommended U.S. Public Health Service Drinking Water Standards. Only 11 exceeded the 500 mg/l recommended limit for Total Dissolved Solids (TDS), but all but one were less than 750 mg/l.

Six of the small surface water supplies had over the recommended limit of 200 parts per billion (ppb) for the chloroform carbon extract (CCE). While 19 samples indicated the presence of pesticides, all results were less than 0.1 ppb and are not considered to be significant. The recommended iron and manganese standards were exceeded four times for samples from treatment plants, but were exceeded 28 times for distribution system samples which indicates the presence of corrosive water

and/or variable treatment practices. In general, the quality of the water in this area is good.

II. RECOMMENDATIONS

A. Operating Personnel

For those supplies with treatment plants:

1. No treatment plant should be left unattended for any appreciable length of time while in operation.

2. No operator should have so many other duties that he does not have time to properly operate and maintain the water treatment plant, conduct necessary laboratory operational control tests, and maintain adequate operating records.

3. Where there is but a single operator, there should be a trained back-up person to fill in when the regular operator is away.

4. The operator should be encouraged and permitted to regularly attend training courses.

5. The operator should be adequately paid.

If the supply does not have sufficient revenue to meet the above operating conditions, it should institute one or more of the following:

1. Adjust their rate schedule to provide sufficient revenue for the proper operating and maintenance of the supply.

2. Purchase finished water from a larger supply that is properly operated and abandon the use of the small treatment plant.

3. Band together with other small supplies to form a district large enough to have sufficient revenue to provide adequate operation and maintenance.

4. Band together with other small supplies to jointly hire a technically competent individual to solve operational problems and train the regular operator.

For those supplies purchasing finished water:

1. For some of the smaller supplies, part time operation may be justified. The operator should be trained and be knowledgeable of the proper procedures for making repairs and new installations, for the collection of bacteriological samples on a regular basis, for the inspection and removal of cross-connections, and for the maintenance of records.

2. If proper operation cannot be provided, the supply should contract with the purveyor to provide these minimum operational requirements.

B. Cross-Connection Control

1. All of the supplies should institute a regular program, including the adoption of an acceptable code, for the detection and elimination of cross-connections. Initially, major emphasis should be given to the larger installations, such as hospitals, mortuaries, plating plants, and other industries using large quantities of water or handling hazardous substances.

2. The State Health Departments should provide the training program to qualify personnel for the local cross-connection programs.

3. In areas where there are individual wells, a regular program should be instituted to be sure none of these wells are inter-connected with the public supply.

4. If the supply is unable to hire a full time staff for a cross-connection elimination program, the meter readers could be trained to make the inspections in addition to their regular duties.

C. Planning

1. Water service should be provided on a regional or area basis without regard to the political boundaries of each town and city. The service area should contain enough customers for the operation to be economically sound.

2. Some of the small supplies in the outlying areas should investigate the possibility of banding together to develop a regional supply compatible with the planning of Metroplan, or for those purchasing finished water, become an integral part of the purveyor's supply with all maintenance and operation being supplied by the purveyor.

D. State Programs

1. The water supply programs in both States should be strengthened to the level where they can employ and hold qualified engineers and technicians to conduct an adequate training program; provide technical assistance, and conduct regular engineering surveillance surveys of all water supplies.

2. The operator certification programs in both States should be mandatory. The above recommended training programs are a necessity if mandatory certification is to be effective.

E. National Needs

1. A national or nationally sponsored effort should be made to develop a continuous monitoring system for taste and odor control that will alert the operator and supply the data needed to determine the treatment processes required.

2. The long term effects and toxic aspects of water quality to health from the many chemical compounds must be kept under close surveillance.

3. The public health significance of bacterial and virus organisms from cattle feedlots upon water supplies should be evaluated.

4. The significance of non-coliform organisms found in the distribution system samples should be investigated to determine if a public health problem exists.

5. The national training facilities in the field of water treatment and laboratory control should be increased to meet the needs of the country.

INTRODUCTION

The purpose of the Community Water Supply Study (CWSS) was to determine if the American consumer's drinking water met the Drinking Water Standards.* To obtain nationwide coverage, the Bureau of Water Hygiene of the U. S. Public Health Service initiated the CWSS in February of 1969 in nine areas across the country. The field work for the CWSS was conducted by the Bureau of Water Hygiene, in cooperation with the state and local health departments and the water utilities.

This study was designed to give an assessment of drinking water quality, water supply systems, and surveillance programs in urban and suburban areas in each of the nine regions of the Department of Health, Education, and Welfare. These areas were selected to give examples of the several types of water supplies in the country. A whole Standard Metropolitan Statistical Area (SMSA) was the basis of each study, except in Region I where the entire State of Vermont was included, with evaluations made on all public water supply systems, as defined herein, in each study area. This coverage allowed an assessment of the drinking water quality of the large central city, the suburbs, and the smaller communities located in the counties in the SMSA, and the interaction between them.

Specifically, the objectives of this study were accomplished by determining whether or not:

1. The quality of the urban and suburban American consumer's drinking water in the selected study areas exceeded the Constituent Limits of the Drinking Water Standards (DWS);*

2. The water supply systems supplying this drinking water to the consumers were essentially free from major deficiencies;

3. The bacteriological surveillance programs over these water supply systems meet the criteria established for this survey (See page III-14)

The authority for the Community Water Supply Study is found in Title III, Part A, Section 301, Public Health Service Act, amended (42 U.S.C. 241).

> "Sec. 301 - The Surgeon General shall conduct in the Service, and encourage, cooperate with, and render assistance to other appropriate public authorities, scientific institutions, and scientists in the conduct of, and promote the coordination of, research, investigations, experiments, demonstrations, and studies relating to the causes, diagnosis, treatment, control, and prevention of physical and mental diseases and impairments of man, including water purification..."

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*1962 U.S. Public Health Service Drinking Water Standards; PHS Publ. No. 956, Superintendent of Documents, Government Printing Office, Washington, D. C. 20402, 61 pp.

SCOPE

Public water supplies in the United States numbered 19,236 serving some 150,000,000 people when last inventoried in 1963.* The remaining 50,000,000 people had private water supplies. Most of the public water supplies were small, about 85 percent serving 5,000 or less people. About one-half of the public was served by the 18,837 supplies that each served 100,000 or less persons and the other one-half (77,000,000) were served by the 399 larger supplies. About 75 percent of these public water supplies have ground water as a source, while 18 percent use surface water. The remaining 7 percent have a mixture of ground and surface water source.

Systems Studied

Nationally, the study covered 969 public water supply systems, including 885 community water supply systems (91.3% of the total) and 84 special water supply systems (8.7% of the total). For this study the following definitions of the systems were used.

PUBLIC WATER SUPPLY SYSTEM - A water supply system includes the works and auxiliaries for collection, treatment, storage, and distribution of water from the sources of supply to the free-flowing outlet of the ultimate consumer. Water supply systems were included in this study, if they had 15 or more service connections and/or served 25 or more consumers.

Special Water Supply Systems - are those systems serving trailer and mobile home parks, other tourist accomodations, and instititions with resident populations.

Community Water Supply Systems - are all other systems studied in an SMSA.

In this Region, 88 public water supply systems (9.1 percent of the national study total) were studied serving about 1,380,000 persons (7.6 percent of the national study total). They consisted of 27 ground water systems, 24 surface water systems, 1 system with mixed (ground and surface) sources, and 36 systems buying finished water from another system, hereafter called wholesale finished water source systems.

For the purpose of this report, water supply systems were divided into four categories: 1) those using surface water or a mixture of surface and ground water as a source; 2) those using ground water as a source; and 3) those purchasing finished water as a source; and 4) special water supply systems. Table I gives data on type, population, average daily demand, and source for the supplies included in this study. Tables II and III show the number of systems in each category and the populations served.

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*Statistical Summary of Municipal Water Facilities in the United States, January 1, 1963: PHS Publ. No. 1039, Government Printing Office, Washington, D. C. 1965, 66 pp.

Study Area

The details of the study area and the definition of Standard Metropolitan Statistical Area (SMSA) are given below.

> STANDARD METROPOLITAN STATISTICAL AREA -- The boundaries and titles of standard metropolitan statistical areas are established by the Bureau of the Budget with the advice of the Federal Committee on Standard Metropolitan Statistical Areas. An SMSA is a county or group of contiguous counties, which contains at least one city of 50,000 inhabitants or more or "twin cities" with a combined population of at least 50,000. In addition to the county, or counties, containing such a city or cities, contiguous counties are included in an SMSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city.

The Kansas City SMSA was selected for DHEW Region VI and the area includes the following six counties:

SMSA KANSAS CITY, MISSOURI - KANSAS

County	1960 Population	1969 1/ Est. Population
Missouri:		
Cass	29,702	39,000
Clay	87,474	135,000
Jackson	622,732	704,000
Platte	23,350	30,500
Kansas:		
Johnson	143,792	216,783
Wyandotte	185,495	188,211
	1,092,545	1,313,494

Map No. I gives the location of the six counties in the two States. Map No. II indicates the location of most of the cities and towns with supplies that were surveyed.

1/ Missouri population estimates obtained from Metropolitan Planning Commission - Kansas City Region. Kansas population estimates obtained from the State of Kansas.

Table I
SUMMARY DATA ON SUPPLIES STUDIED IN SMSA

Name of Supply	Type	Population	Average Daily Demand (mgd)	Source
Archie, Mo	Community	348	0.032	Surface
Belton, Mo	Community	4,897	0.80	Finished
Blue Springs, Mo	Community	2,555	0.4	Finished
Bonner Springs, Ks	Community	3,642	0.273	Well
Buckner, Mo	Community	1,198	0.15	Finished
Clay County WD #2, Mo	Community	No Data	0.14	Finished
Clay County WD #3, Mo	Community	281	0.035	Well
Clay County WD #4, Mo	Community	No Data	0.027	Finished
Clay County WD #5, Mo	Community	No Data	0.03	Well
Clay County WD #6, Mo	Community	No Data	0.04	Finished
Cleveland, Mo	Community	216	0.015	Surface
Creighton, Mo	Community	228	0.01	Well
Dearborn, Mo	Community	No Data	0.039	Surface
De Soto, Ks	Community	1,620	0.176	Well
Drexel, Mo	Community	651	0.055	Surface
East Lynne, Mo	Community	243	0.008	Well
Edgerton, Ks	Community	435	0.03	Surface
Edgerton, Mo	Community	449	0.016	Well
Excelsior Springs, Mo	Community	6,473	0.9	Well
Freeman, Mo	Community	391	0.03	Surface
Garden City, Mo	Community	600	0.06	Surface
Gardner, Ks	Community	1,771	0.20	Surface
Gladstone, Mo	Community	14,502	1.4	Well
Grain Valley, Mo	Community	552	0.03	Surface
Harrisonville, Mo	Community	3,510	0.445	Surface
Jackson County Water Co, Mo	Community	No Data	0.016	Finished
Jackson County WD #1, Mo	Community	10,116	1.0	Finished
Jackson County WD #2, Mo	Community	17,083	1.27	Finished
Jackson County WD #8, Mo	Community	No Data	0.3	Finished
Jackson County WD #12, Mo	Community	488	0.005	Finished
Jackson County WD #13, Mo	Community	No Data	0.04	Finished
J. C. Nichols Co, Ks	Community	Incl. in WD #1, Johnson Co. figure	1.32	Finished
Kansas City, Ks	Community	169,920	31.9	Surface
Kansas City, Mo	Community	475,539	97.94	Surface
Kearney, Mo	Community	678	0.15	Well
Lake Annette, Mo	Special	No Data	No data	Well
Lake City Arsenal, Mo	Special	No Data	2.8	Well

NOTE: Under the "Source" heading, the word "Finished" means that the water supply buys water from another water supply.

Table I

SUMMARY DATA ON SUPPLIES STUDIED IN SMSA - continued

Name of Supply	Type	Population	Average Daily Demand (mgd)	Source
Lake Tapawingo, Mo	Community	No Data	0.05	Finished
Lake Waukomis, Mo	Community	506	0.057	Finished
Lake Winnebago, Mo	Community	No Data	0.0425	Finished
Lakeside Gardens Sub., Mo	Community	No Data	0.0013	Finished
Lawson, Mo	Community	778	0.083	Surface
Lazy Acres Trailer Park, Mo	Special	No Data	No Data	Finished
Lee's Summit, Mo	Community	8,267	2.7	Finished
Lenexa, Ks	Community	5,124	0.66	Finished
Liberty, Mo	Community	8,909	1.08	Well
Missouri Water Co, Mo	Community	116,759	12.75	Well
Missouri Cities Water Co, Mo	Community	1,229	0.97	Well
Mosby, Mo	Community	293	0.011	Well
North Kansas City, Mo	Community	5,657	3.8	Well
Oak Grove, Mo	Community	1,463	0.1	Surface
Olathe, Ks	Community	17,104	1.44	Combination
Olathe Naval Air Station, Ks	Special	No Data	0.286	Surface
Olathe Trailer Court, Ks	Special	51	No Data	Well
Olson's Oasis Well, Mo	Special	No Data	No Data	Well
Peculiar,Mo	Community	458	0.06	Surface
Platte City, Mo	Community	1,188	0.135	Well
Platte County WD #1, Mo	Community	120	0.008	Well
Platte County WD #2, Mo	Community	171	0.018	Well
Platte County WD #3, Mo	Community	No Data	0.018	Finished
Platte County WD #4, Mo	Community	No Data	0.045	Well
Platte County WD #5, Mo	Community	110	0.046	Well
Platte County WD #6, Mo	Community	No Data	0.0125	Finished
Pleasant Hill, Mo	Community	2,689	0.351	Surface
Quick-Way Homes, Inc., Ks	Community	1,750	0.1	Finished
Quivira, Inc., Ks	Community	1,000	0.1	Finished
Raymore, Mo	Community	268	0.025	Surface
Raytown, Mo	Community	No Data	1.5	Finished
Richards-Gebaur AFB, Mo	Special	No Data	0.82	Finished
RWD #1, Johnson County, Ks	Community	560	0.033	Finished
RWD #2, Johnson County, Ks	Community	1,640	0.09	Surface
RWD #3, Johnson County, Ks	Community	1,180	0.006	Finished
RWD #4, Johnson County, Ks	Community	480	0.02	Finished
RWD #1, Wyandotte County, Ks	Community	760	0.05	Well
RWD #2, Wyandotte County, Ks	Community	480	0.03	Finished
RWD #3, Wyandotte County, Ks	Community	360	0.004	Finished
RWD #4, Wyandotte County, Ks	Community	480	0.025	Finished
RWD #7, Leavenworth Co, Ks	Community	720	0.017	Finished
Smithville, Mo	Community	1,254	0.112	Surface
Sugar Creek, Mo	Community	2,663	0.32	Finished
Sunflower, Ks	Special	No Data	5.9	Combination
Spring Hill, Ks	Community	926	0.09	Surface

NOTE: Under the "Source" heading, the word "Finished" means that the water supply buys water from another water supply.

Table 1

SUMMARY DATA ON SUPPLIES STUDIED IN SMSA - continued

Name of Supply	Type	Population	Average Daily Demand (mgd)	Source
Tracy, Mo	Community	208	No Data	Well
Unity Village, Mo	Community	No Data	0.075	Surface
WD #1 of Johnson County, Ks	Community	179,066*	13.25	Combination
West Belton, Mo	Community	No Data	0.06	Finished
Weatherby Lake, Mo	Community	376	0.040	Finished
Weston, Mo	Community	1,057	0.15	Well

* Combined population of 12 communities

NOTE: Under the "Source" heading, the word "Finished" means that the water supply buys water from another water supply.

TABLE II

WATER TREATMENT PRACTICES IN THE SYSTEMS STUDIED

Treatment Practice	Type of System (Number of Systems of each)				Overall System Totals	
	Surface Water & Mixed Source	Ground Water Source-Wells	Wholesale Finished Water Source	Special Systems	Number	Percent
Do not disinfect, clarify, or buy chlorinated water	0	0	0	2	2	2
Disinfection only or buy chlorinated water	0	3	33	2	38	43
Clarification* and disinfection	23	20	1	4	48	55
System Totals - Number	23	23	34	8	88	100

*Clarification is the removal of suspended material by coagulation, sedimentation and/or filtration.

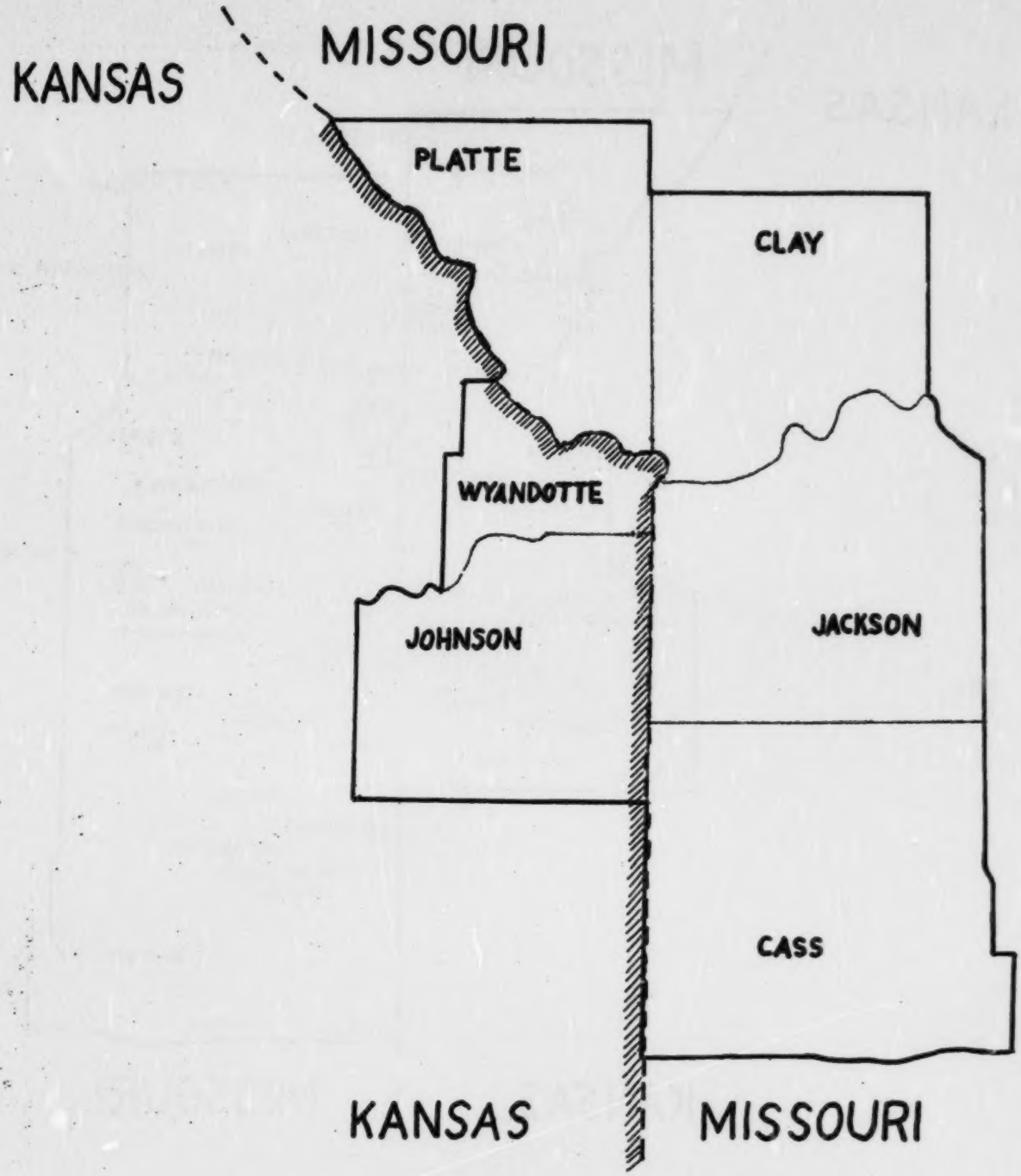
TABLE III

WATER TREATMENT PRACTICES IN THE SYSTEMS STUDIED

Treatment Practice	Population Served in Thousands (Number of Systems of Each)						Overall System Totals	
	< .5	.5-5	5-10	10-25	25-100	> 100	Number	Percent
Do not disinfect, clarify, or buy chlorinated water	2	0	0	0	0	0	2	2
Disinfection only or buy chlorinated water	9	21	3	5	0	0	38	43
Clarification* and disinfection	13	24	3	4	0	4	48	55
System Totals - Number	24	45	6	9	0	4	88	100

*Clarification is the removal of suspended material by coagulation, sedimentation and/or filtration.

MAP NO. 1


KANSAS
MISSOURI
PLATTE
CLAY
WYANDOTTE
JOHNSON
JACKSON
CASS
KANSAS
MISSOURI

MAP NO. 11

KANSAS
MISSOURI
DEARBORN
EDGERTON
CAMDEN POINT
WESTON
TRACEY
PLATTE CITY
HOLT
LAWSON
SMITHVILLE
KEARNEY
EXCELSIOR SPRINGS
KANSAS CITY NORTH
LIBERTY
GLADSTONE
WALDRON
PARKVILLE
NORTH KANSAS CITY
BUCKNER
BASEHOR
KANSAS CITY
INDEPENDENCE
BONNER SPRINGS
KANSAS CITY
BLUE SPRINGS
OAK GROVE
GRAIN VALLEY
DE SOTO
LENEXA
SUNFLOWER AMMO.
RAYTOWN
UNITY VILLAGE
LEE'S SUMMIT
RICHARDS GEBAUR AFB
OLATHE
GREENWOOD
STANLEY
GARDNER
RAYMORE
BELTON
PLEASANT HILL
SPRING HILL
EDGERTON
PECULIAR
CLEVELAND
HARRISONVILLE
E. LYNNE
LAKE ANNETTE
FREEMAN
GARDEN CITY
CREIGHTON
DREXEL
ARCHIE
KANSAS
MISSOURI

EVALUATION CRITERIA

Each water supply system was investigated on three bases: 1) drinking water quality was determined by sampling the finished and distributed water and returning these samples to the laboratories of the Bureau of Water Hygiene for bacteriological, chemical, and trace metal analyses, 2) the status of the water supply system facilities was determined by a field survey of the system and the gathering of data on three standard forms (four items were chosen to represent major problems: (a) source(s), (b) treatment, if any, (c) distribution system pressures, and (d) operation); 3) the status of the surveillance program over the water supply system was evaluated by obtaining bacteriological water quality data for the previous 12 months of record from state health department files.

Water Quality Criteria

Water quality was judged either:

(1) Not to exceed the Constituent Limits of the DWS (hereafter called Met Drinking Water Standards) or,

(2) To exceed at least one "recommended" Constituent Limit (some are aesthetic parameters), but does not exceed any "mandatory" Constituent Limit (hereafter called Exceeded recommended, but not mandatory limits) or,

(3) To exceed at least one "mandatory" Constituent Limit (hereafter called Exceeded mandatory limits).

The limits for the constituents measured in this study are summarized in Table IV below.

TABLE IV

Partial List of Bacteriological, Chemical, and Physical Constituent Concentration Limits Taken from the 1962 U.S. Public Health Service Drinking Water Standards

RECOMMENDED LIMITS

(If the concentration of any of these constituents are exceeded, a more suitable supply or treatment should be sought)

Constituent	Limit
Alkyl Benzene Sulfonate (Measured as methylene-blue-active substances)	0.5 mg/l
Arsenic	0.01 mg/l*
Boron	1.0 mg/l**
Chloride	250 mg/l
Color	15 Units
Copper	1.0 mg/l
Carbon-Chloroform Extract (CCE)	0.200 mg/l
Cyanide	0.01 mg/l
Fluoride	
Temp. (Ann.Avg.Max.Day, 5 years or more)	
50.0-53.7	1.7 mg/l
53.8-58.3	1.5 mg/l
58.4-63.8	1.3 mg/l
63.9-70.6	1.2 mg/l
70.7-79.2	1.0 mg/l
79.3-90.5	0.8 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Nitrate (as NO_3)	45 mg/l
Radium-226	3 pCi/l ***
Strontium-90	10 pCi/l ***
Sulfate	250 mg/l
Total Dissolved Solids (TDS)	500 mg/l
Turbidity	
Untreated	5 Units
Treated by more than disinfection	1 Unit
Zinc	5 mg/l

TABLE IV (Contd.)
MANDATORY LIMITS

(If the concentration of any of these constituents are exceeded, the further use of this water for drinking and culinary purposes should be evaluated by the appropriate health authority because water of this quality represents a potential hazard to the health of consumers.)

Constituent	Limit
Arsenic	0.05 mg/l
Barium	1.0 mg/l
Boron	5.0 mg/l**
Cadmium	0.01 mg/l
Chromium (hexavalent)	0.05 mg/l
Coliform organisms (Measured by membrane filter technique)	Fails std. if: a) Arithmetic average of samples collected greater than 1 per 100 ml b) Two or more samples (5% or more if more than 20 examined) contain densities more than 4/100 ml
Cyanide	0.2 mg/l
Fluoride	
Temp. (Ann.Avg.Max.Day - 5 years or more)	
50.0-53.7	2.4 mg/l
53.8-58.3	2.2 mg/l
58.4-63.8	2.0 mg/l
63.9-70.6	1.8 mg/l
70.7-79.2	1.6 mg/l
79.3-90.5	1.4 mg/l
Gross Beta activity (in the absence of or Sr-90)	1,000 pCi/l ***
Lead	0.05 mg/l
Selenium	0.01 mg/l
Silver	0.05 mg/l

---

* Although the recommended arsenic concentration is 0.01 mg/l, because of interferences in some waters, the concentration of arsenic was only determined to be less than 0.03 mg/l. For the purposes of this study, these waters were considered not to exceed the recommended standard.
** Proposed for inclusion in the Drinking Water Standards.
*** If these limits are exceeded, refer to Section 6.2 of the DWS.

Facilities Criteria

Source, treatment, operation, and distribution facilities were judged either:

1) To be essentially free from major deficiencies, or
2) To have one or more of the following major deficiencies (where applicable)

   a) Inadequate source protection (in absence of disinfection or buying chlorinated water)
   b) Inadequate disinfection (if disinfection practiced)
   c) Inadequate control of disinfection (if practiced or if purchasing chlorinated water)
   d) Inadequate clarification capabilities (if clarification practiced)
   e) Inadequate control of clarification (if clarification practiced)
   f) Inadequate pressure (<20 psi) in some or all areas of the distribution system

Bacteriological Surveillance Program Criteria

The bacteriological surveillance program over the water supply system was judged either:

1) To meet the following criteria or,
2) Not to meet one or both of the following:

   a) Collection of the required number* of bacteriological samples for no less than 11 months during the previous 12 months of record.
   b) Passing the bacteriological quality standard* for no less than 11 months during the previous 12 months of record.

*See pages 3-6 of the Drinking Water Standards.

IV. METHODS

Field Survey

The regional office staff, in cooperation with the state and local health department officials prepared a listing of all known water supplies meeting the definition adopted for this study. The list contained the supply name, address, name of the superintendent or person in charge, indication of size and the telephone number. The list was cross-checked with community and subdivision names to eliminate duplication and establish those areas for which the water supply facilities were apparently unknown. A Form PHS-682, Report of Water Supply Used on Interstate Carriers, was prepared for each supply from state health department records. The completed list became the basis for work schedules for the field engineers.

Actual field surveys were made by eight of the PHS engineers from headquarters and the regional offices. Engineers from both of the state health departments made surveys with the PHS engineers. The Kansas and Missouri state health departments made the appointments several weeks in advance of the study.

During the field survey, the engineer completed Forms ECA-18, Inventory of Municipal Water Facilities, and ECA-19, Municipal Water Supply Sanitary Survey, to provide information on source; treatment; operation; laboratory control; personnel; distribution; surveillance practices; planning for improvements; and water rates. Examples of the standard forms are in the Appendix.

Sampling Program

The following samples were collected and dispatched to various Bureau of Water Hygiene laboratories:

1) Raw water
   One sample for bacteriological analysis.

2) Finished water ready for distribution
   Four or 5 samples for chemical analyses as follows:

   a) 2½-gallon sample to the Northeast Water Hygiene Laboratory. This was a grab sample for most ground water and small surface water treatment plants, but where possible a 14-day composite was taken. The following analyses were made on this sample:

Arsenic	Cyanide	Sulfate
Boron	MBAS	TDS
Chloride	Nitrate	Turbidity
Color	Selenium	

b) 8-oz. aliquot sample for trace metals analysis was taken out of sample 2)a) above and sent to the Cincinnati Laboratory. The following analyses were made on this sample:

Barium	Copper	Manganese
Cadmium	Fluoride	Nickel
Chromium	Iron	Silver
Cobalt	Lead	Specific Conductance
		Zinc

c) 1-gallon sample for radioactivity analyses was sent to one of the three Bureau of Radiological Health laboratories. It was collected in the same manner as sample 2)a) above. The following analyses were made on this sample:

Specific gamma emitting radionuclides (I^{131}, Cs^{137}, Ba^{140})
Gross Alpha
Gross Beta
Radium-226, if gross alpha exceeded 3 pCi/l
Strontium-90, if gross beta exceeded 10 pCi/l

d) 1-gallon sample for pesticide analysis to the Gulf Coast Water Hygiene Laboratory from surface water supplies plus those ground water supplies where sampling was specifically requested by the state or county health officials. It was collected in the same manner as sample 2)a) above. The following analyses were made on this sample:

Aldrin	Dieldrin	Heptachlor Epoxide
Chlordane	Endrin	Lindane
DDT	Heptachlor	Methoxychlor
		Toxaphene

e) 1 activated carbon monitor sample to the Cincinnati Laboratory from 23 surface sources. Carbon chloroform extract (CCE) and carbon alcohol extract (CAE) concentrations were determined from this monitor.

3) Distribution System
Samples for bacteriological and trace metal analyses at the rate of 10 percent of the number required by Figure 1, of the DWS, with a minimum of 2 each from any water supply.

Laboratory Procedures

Bacteriological

All samples were collected in 8-oz. sterile, plastic, wide-mouth, screw-capped bottles which contained 0.2 ml of a 10% solution of sodium thiosulfate as a dechlorinating agent. This concentration of thiosulfate was sufficient to neutralize a sample containing about 15 mg/l

residual chlorine, an amount above any residual that was present. Refrigeration of all samples was required during transportation back to the laboratory. Maximum time between collection and analysis did not exceed 30 hours. The bacteriological procedures were those of Standard Methods.*

The membrane filter (MF) procedure was used for total coliform detection in this study for three reasons. One, larger volumes (100-ml portions) of distributed water could be examined than with the MPN techniques; two, the MF procedure yields more precise results; and three, less processing time would be involved per sample, so reexamination of many of the samples could have been made within the 30-hour time limit if required. All potable and source water samples were examined for total coliforms using M-Endo MF broth, incubated at 35°C for 20-24 hours. Because raw water quality varied with its source, three decimal sample portions were filtered, the volume being determined by the estimated water quality.

Any coliform colonies detected in the examination of a sample were further verified by transfer to phenol red lactose for 24- and 48-hour periods at 35°C incubation. All positive phenol red lactose broth tubes then were confirmed in brilliant green lactose at 35°C for verification of total coliforms and in EC medium at 44.5°C for detection of fecal coliforms. This procedure further confirmed the standard total coliform MF test and supplied additional information on the potentially hazardous occurrence of fecal coliform in those potable water supplies.

Basic knowledge was also needed on the general bacterial population of potable water. Therefore, the general population of bacterial count (plate count) was also made on all distribution system samples. Sample portions of 1 ml and 0.1 ml in plate count agar (Tryptone-Glucose-Yeast Agar), incubated 48 hours at 35°C were sufficient to yield the desired data.

Chemical

The five samples, as noted above, taken to determine the chemical quality of the finished and/or distributed water were analyzed as follows:

Sample 2)a), General Chemistry.
These constituents were generally determined by Standard Methods, except as listed below.

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*Standard Methods for the Examination of Water and Wastewater, 12th Ed., APHA, AWWA, and WPCF. American Public Health Association, New York, N.Y., 1965. 796 pp.

Barium
No standard method existed at the time this study was undertaken. An atomic absorption procedure, which will appear in the next edition of Standard Methods, was used and was found acceptable. The analysis was made only on those samples that had less than 2 mg/l because above that concentration the barium precipitates out of solution.

Chloride
A variation of the potentiometric titration procedure was used, which is a tentative method in Standard Methods, page 372. Rather than titrate with silver nitrate to a specified end-point in millivolts, using a glass electrode and a silver-silver chloride electrode, a standard curve was prepared that related millivolts to chloride concentration. The concentration of an unknown is then determined from the standard curve. The procedure was just as accurate as the titration method and was simpler to carry out.

Fluoride
A fluoride electrode method, which will appear in the next edition of Standard Methods, was used. Precision and accuracy was generally better than any other method and the method was simpler to carry out.

Sample 2)b), Trace Metals.
The atomic absorption spectrophotometer method was used for all heavy metals (cadmium, chromium, copper, iron, lead, manganese, silver, zinc, nickel, and cobalt) because its sensitivity, specificity, simplicity and speed of analysis far exceeded the usual wet chemical methods. An atomic absorption method for these metals will appear in the next edition of Standard Methods.

Sample 2)c), Radioactivity.
These radiological constituents were determined using standard radiological counting techniques.

Sample 2)d), Pesticides.
No standard procedure for pesticide determinations existed at the time the CWSS was undertaken. Gas chromatography is generally the accepted method of analysis and will appear in the next edition of Standard Methods. Therefore, this technique was used.

Sample 2)e), Organics (CCE and CAE).
These organic constituents were determined using standard extraction techniques.

V. RESULTS

A. Sample Results

1. Bacteriological

During the survey, 43 raw water samples were collected from the sources such as rivers, reservoirs, and wells ahead of the treatment units. Total and fecal coliform analyses were made for each sample. The results are as follows:

Raw Water Samples

	Verified Total Coliform	Fecal Coliform
No. Positive Samples	22	14
Minimum and Maximum count	10-30,000	3-6,400
Median Count	105	58
No. Negative Samples	21	29

The higher counts were from those samples collected from the rivers. No coliform or fecal coliform were found in most of the well samples and some of the reservoirs. While these negative results are indicative of proper sanitary control measures, only a regular sampling program in conjunction with regular sanitary surveys can provide a reliable evaluation. On the form ECA-19, 22 supplies indicated they sample the raw water source for bacteriological analysis.

There were 239 finished water samples from the distribution systems analyzed for verified total coliform, fecal coliform and total plate count. The chlorine residual was also recorded when these samples were collected. The results of these analyses are as follows:

Distribution Water Samples

	Verified Total Coliform	Fecal Coliform	Plate Count
No. Positive Samples	17	9	204
Minimum and Maximum count	1-500[1/]	1-300[1/]	1-9,999[2/]
Median Count	30[1/]	68[1/]	19[2/]
No. Negative Samples	222	230	35

1/ Organisms/100 ml
2/ Organisms/ml

Chlorine residual was found in 189 of the samples. Of the 17 positive coliform samples, 5 had a chlorine residual between a trace and 1.2 mg/liter and 7 of the positive samples came from the 2 well supplies that do not chlorinate. Fecal coliform were found at the pressure tank of 1 of the unchlorinated supplies.

The sample results outlined above were indicative of conditions at specific sampling locations during the survey. The bacteriological records maintained by the States are used to evaluate the bacteriological quality of the supplies.

2. Wet Chemistry

Fifty-eight samples of treated water were collected at the plants or at the source where treatment wasn't provided. Over one-half of the samples were collected at the time of each survey while the remainder were composited over a 2-week period.

Only 19 of the 580 analyses (10 analyses for each sample) exceeded either the recommended or mandatory rejection limits. Eleven of the samples exceeded the recommended limit of 500 mg/l for total dissolved solids (TDS) with the following distribution:

TDS Range (mg/l)	Number of Samples
500 - 525	4
525 - 550	3
650 - 750	3
Over 2,000	1

The one supply with 2,384.8 mg/l TDS also had a chloride content of 1,090, 3.0 mg/l of fluoride, and a boron analysis of 1.339 mg/l. The chemical quality of this water is poor but no other source is available or practical for this small community at this time.

Only one sample exceeded the recommended nitrate limit (50.5 mg/l).

One sample had a turbidity of 6.2 S.U. which exceeds the 5.0 S.U. recommended limit.

3. Carbon Chloroform Extract (CCE)

Twenty-three carbon filters were installed on a treated water line in the surface water treatment plants. The filters were in operation for about two weeks and the flow was regulated to as close to one-fourth gallon per minute as possible.

Analyses were made for chloroform and alcohol extracts. Chloroform extracts (CCE) are generally considered to contain man-made organics associated with industrial products and wastes that have not been

removed in the water treatment processes. In view of a general inability to clearly define the chemical and toxicological nature of this extract, the 1962 Public Health Service Drinking Water Standards recommended the limiting concentration of 200 parts per billion (ppb) in drinking water. The alcohol extract (CAE) consists largely of organics of natural origin not removed by water treatment processes. Six of the samples exceeded the 200 ppb CCE recommended limit. A tabulation of these 6 surface supplies is as follows:

CCE ppb	CAE ppb	Total Extractables ppb
203	223	426
247	389	636
253	360	613
329	392	721
343	424	767
560	809	1,369

All 6 of these samples came from small supplies serving communities of less than 1,000 people.

4. Pesticides

None of the samples collected from the 25 surface water supplies exceeded the recommended limits. Nearly all of the samples were composited over a 2-week period. Only treated water was collected. The following is a tabulation of the analyses made and the frequency of detection for each of the pesticides:

Pesticide	Minimum Detection Level (ppb)	No. of Samples in which the Pesticide was Detected
Aldrin	<0.1	1
Chlordane	<0.1	5
DDT	<0.1	15
Dieldrin	<0.1	11
Endrin	<0.1	9
Heptachlor	<0.1	2
Heptachlor-epoxide	<0.1	3
Lindane	<0.1	2
Methoxychlor		None
Toxaphene		None

Some of the samples contained more than one pesticide. The following is a tabulation of the number of pesticides found in each sample:

No. of Pesticides Detected per Sample	No. of Samples
6	1
5	1
4	2
3	5
2	4
1	6
0	6
Total Number of Samples	25

5. Radiological

Fifty-eight samples of treated water were collected for radiochemical analyses. All samples were collected at the treatment plant or at the source where treatment was not provided. Over one-half of the samples were collected at the time of the survey while the others were composited over a 2-week period.

Each sample was analyzed for total beta and total alpha activity. Only 1 sample had a high enough gross alpha activity to be analyzed for Radium-226. This sample contained 4.3 pCi/liter of Radium-226 which exceeds the recommended limit of 3.0 pCi/liter in the 1962 Public Health Service Drinking Water Standards. This sample came from the 1 highly mineralized well supply serving a small community.

6. Trace Elements

A total of 294 trace element samples were collected, of which 236 were taken from distribution systems and 58 from a finished water tap at the treatment plant.

The following is a tabulation of only those samples that exceeded the limits shown on pages III-12 and 13:

	Distribution System		Treatment Plant	
Element	No. Samples	Range	No. Samples	Range
Iron	14	0.375 - 5.36	3	1.10 -2.17
Manganese	12	0.058 - 1.32	5	0.065-1.33
Lead	1	0.079	3	0.052-0.152
Copper	1	1.72		----None----
Fluoride	11	1.20 - 3.00	2	1.25 -3.00
Boron	2	1.34	1	1.34

B. Evaluation Criteria of Survey Data

The following is a tabulation of the results obtained from the survey forms and laboratory analyses for the water quality criteria, facilities criteria, and bacteriological surveillance discussed previously in Chapter III.

1. Water Quality Evaluation

Sixty-four of the systems did not exceed any of the recommended or mandatory constituent standards. The remaining 24 systems exceeded the following recommended constituent standards:

Constituent Standard	Number of Systems
Total Dissolved Solids	11
Iron	7
Manganese	7
CCE	6
Fluoride	2
Turbidity	1
Boron	1
Chlorides	1
Radiochemical	1
Copper	1
Nitrate	1

Eight of the 24 systems exceeded more than one of the recommended standards; five exceeded three standards, one exceeded four standards, and the other one exceeded two standards. Also, three of the 24 systems exceeded the mandatory standards; one for fluorides and two for coliform content.

2. Facilities Evaluation

A review of the survey form, ECA-19, indicated the following deficiencies existed at the time of the survey:

Deficiency	No. of Systems
Inadequate control of clarification	20
Low (<20 psi) pressure	13
Inadequate clarification	10
Inadequate disinfection	3
Inadequate control of disinfection	5
Inadequate source protection	1

Forty-nine systems were found free of deficiencies. Seven of the remaining 39 systems each had two deficiencies while three systems had three deficiencies each.

3. Bacteriological Surveillance Evaluation

The bacteriological record for each system was obtained from the State Health Departments and tabulated on the form PHS-682. The following is an evaluation of this data based on the Drinking Water Standards. In some cases, the number of samples required by the States vary from those of the Drinking Water Standards (See Appendix D).

Frequency of Sampling	Number of Systems
Collected required number of samples (DWS) for no less than 11 of previous 12 months	52
Collected more than half required samples (DWS) for 12 months or collected required samples (DWS) for more than 6 but less than 11 months	13
Collected half or less of required number of samples (DWS) each month	23*

Forty-nine of the 52 systems submitting the required number of samples for at least 11 months had a satisfactory bacteriological quality record. The other three systems did not meet the standards for 2, 3, and 4 months respectively. One of 13 systems collecting more than half the required number of samples did not meet the bacteriological quality standard for 2 months.

*Includes 15 that collected no samples.

VI. DISCUSSION

A. Tabulation of the Supplies

There were a total of 88 water supplies. Of these, 36 (41 percent) bought their water from another supply and are classified as finished water systems with no responsibility for treatment. Twenty-five of the supplies (28 percent) obtained their water from a river or reservoir, provided complete treatment for surface water, and operated and maintained a distribution system. Twenty-two (25 percent) obtained their water from wells, and operated and maintained treatment and distribution facilities. The remaining 5 supplies (6 percent), derived their water from wells. Three of them provided chlorination; the other 2 provided no treatment. All of the 5 maintained distribution systems.

Table V provides a listing of the supplies by county based on the above listed categories.

Based on the estimates provided during the survey, approximately 1.4 million people are served by these 88 supplies. It is apparent the 88 estimates of population served were high since the total exceeds the total estimated population living in the area. There is some duplication since 1 city included the 69,000 people in the 10 finished water systems to whom they sell water. It is estimated that at least 97 percent of the population in the area is served by the 88 supplies. For the purposes of this report, the population estimates given the field engineer will be used. The following four supplies provide water to about 1.1 million people or about 80 percent of the total:

Kansas City, Missouri
Board of Public Utilities, Kansas City, Kansas
Johnson County Water District No. 1
Missouri Water Company, Independence, Missouri

Twenty-two of the 36 finished water systems are served by the above 4. The interconnection of all of these supplies will be covered in another section.

Table VI is a tabulation of the supplies based on the population served and the type of operation based on the source of the raw water. Of the 88 supplies, 40 (45 percent) serve less than 2 percent (18,538) of the total population served. Each of the 40 provides service to less than 1,000 people.

Table V

TABULATION OF THE SUPPLIES
by
COUNTY, SOURCE OF WATER, AND DEGREE OF TREATMENT PROVIDED

County	Surface Water Source Using Complete Treatment		Well Water Source			Finished Water System Only	Total	Served Population
	River	Reservoir	Iron Removal 1/	Chlorination Only	No Treatment	No Treatment 2/		
Cass	1	8		2	2	5	18	25,303
Clay		2	8			3	13	64,590
Jackson	3	1	1			12	17	859,762
Johnson	1	5	2			7	15	204,327
Platte		1	8	1		4	14	19,940
Wyandotte	1		2			4	7	185,809
Federal Installations								
Jackson			1			1	2	17,000
Johnson	1	1					2	6,766
	7	18	22	3	2	36	88	1,383,497

1/ Treatment includes chlorination
2/ All water is treated by purveyors

Table VI

TABULATION OF SUPPLIES
by
POPULATION GROUPINGS AND SOURCE OF WATER

Type of Supply	Serves less than 1,000		Serves between 1,000 - 5,000		Serves between 5,000 - 25,000		Serves over 100,000		Total	
	No. Supplies	Total Pop. Served	No. Supplies	Total Pop. Served	No. Supplies	Total Pop. Served	No. Supplies	Total Pop. Served	No. Supplies	Total Pop. Served
Surface	11	6,194	10	25,421	1	15,000	3	989,923	25	1,036,538
Wells:										
Iron Removal	9	3,726	6	11,400	6	71,100	1	116,000		
Chlorination Only	3	1,429								
No Treatment	2	310								
SUB-TOTAL FOR WELL SUPPLIES									27	203,965
Finished Water System Only	15	6,879	13	25,915	8	110,200			36	142,994
TOTAL	40	18,538	29	62,736	15	196,300	4	1,105,923	88	1,383,497

B. Sources of Water Used

1. Missouri River

The Missouri River is the source of raw water for 2 of the major supplies included in this survey; namely, Kansas City, Missouri and Kansas City, Kansas. Also, approximately 14 cities above the Kansas Citys utilize the Missouri River for their supply. In recent years, the Corps of Engineers has completed a number of regulating reservoirs located upstream from Gavins Point, South Dakota. The flow of the River at Kansas City is kept at 32,000 cfs or higher during the navigation season, usually from late March until early December. The winter flow is usually kept at 6,000 cfs or more. Also, with this flow regulation, there has been a reduction in the median turbidity in the River from about 3,000 to 300 S.U. Turbidities up to 12,000 S.U. still occur, but not as often since the construction of the reservoirs.

Historically, the cities using water from the Missouri have experienced taste and odor problems, both from natural runoff conditions and from industrial wastes. As a result of these taste and odor problems, 11 of the communities formed the Missouri River Public Water Supplies Association to study the problem and to share their common operational experiences. This Association reports that there was a reduction in the taste and odor problems during the winters of 1966-67 and 1967-68. In 1969, Kansas City, Missouri experienced 2 taste and odor problems that were noticeable enough in the system to generate newspaper and radio comments. During February and March the problem was believed to be caused by natural runoff conditions; the potassium permanganate demand increased to 15-20 mg/l whereas the normal demand is 1-1.25 mg/l. From May through August, the problem was attributed to improper industrial waste disposal practices just above their intake.

Upstream from the Kansas Citys, there are quite a number of cities that discharge their wastes to the River. Prior to 1957, most of these cities discharged their wastes untreated direct to the Missouri River. At present, 14 of these cities with a connected population of about 450,000 now provide primary treatment and 15 cities with a connected population of about 15,000 provide secondary treatment. The waste discharge problem was complicated by the discharge of a considerable volume of packing house wastes from plants in the States of Nebraska, Missouri, and Iowa and it was not until September of 1969 that the last of the treatment facilities was completed. Some of the cities have not completed all of the construction required to eliminate all raw sewage discharges to the River.

While the municipal and industrial waste problem has been partially resolved, the growth of the cattle feedlot industry in the past few years has resulted in the introduction of a greatly increased microbiological load to the River. This great increase in the number of cattle concentrated in small areas presents a new challenge to find new ways to minimize the effect of this pollutional load upon the River.

Historically, the raw water entering the 2 Kansas City water treatment plants has, much of the time, a total coliform count in excess of the 20,000 organisms per 100 milliliters which is the recommended limit by the U.S. Public Health Service for treatment by complete conventional means.1/ As a result, the Citys have additional treatment equipment to insure that a safe water is delivered to the distribution systems.

2. Kansas River

The Kansas River in conjunction with a shallow well field is used as a source of water for Johnson County Water District No. 1 which is 1 of the 4 main suppliers of water in this area. Above their intake, there are 10 towns and cities with a combined population of about 98,000 that have waste treatment plants providing primary treatment with the discharge of the effluents directly to the Kansas River. Five towns and cities with a connected population of about 133,000 provide secondary treatment with the discharge of their effluent directly to the Kansas River. The flow of the River varies greatly with a long term average flow of 8,285 cfs.

3. Reservoirs

Twenty-two of the supplies serving approximately 47,000 people derive their raw water for treatment from reservoirs. Four of these 22 pump raw water from small streams to upland reservoirs with several months' storage. The remaining 18 depend mainly on rainfall and runoff to fill their reservoirs. Many of these supplies have problems with taste and odors associated with improper operation of the reservoir or treatment plant, or other causes during various times of the year.

4. Shallow Wells

Twenty-five of the supplies use what is termed, "shallow wells," as their source of water. One of these supplies, the Missouri Water Company at Independence, is 1 of the 4 major supplies serving approximately 116,000 people. Most of these wells are in the range of 30 to 200 feet in depth and most of them are in the alluvium in the valleys of the Missouri and Kansas Rivers. The waters derived from these wells, for the most part, have characteristics of high iron and manganese which requires treatment. The water is usually hard and some of the plants soften the water.

5. Deep Wells

Two of the supplies utilize what are known as "deep wells" which are 187 and 276 feet deep and are serving a combined population of 525. Both of these installations are in Cass County and 1 of the wells has extremely poor chemical quality while the other is of good quality. It is known from the past explorations that there are

1/ These bacteriological limits may possibly be exceeded if treatment (in addition to coagulation, sedimentation, rapid granular filtration, and disinfection) is provided and is shown to be doing a satisfactory job of providing health protection.

very few locations in Cass County where water with suitable chemical quality can be obtained from deep wells.

6. Other

Thirty-six of the supplies included in this survey buy their water from another supply. The interconnection of the supplies will be covered in greater depth under Section E.

C. Type of Treatment Used

1. Surface Water

There are 25 supplies utilizing surface water. The 3 major supplies utilizing river water have presedimentation basins, multiple facilities for taste and odor removal, coagulation, mixing, sedimentation, filtration, and disinfection. Chlorine can be added at various points in the treatment plant to best suit the treatment needs. Two of the plants have softening. All of the supplies utilizing a reservoir have facilities for mixing, coagulation, sedimentation, filtration, and disinfection. A few of them have facilities for softening and some of them use activated carbon for taste and odor control.

2. Wells

Twenty-two of the shallow well supplies have iron removal facilities which consist of aeration, sedimentation, filtration, and disinfection. Kansas recommended that chlorine be applied ahead of the aerator to improve the iron removal process; the dosage should be enough to carry over a residual of 1 mg/l to the top of the filter. Missouri recommends post aeration and post filtration chlorination. Some of these plants also soften the water and a few add chemicals to hold any remaining iron in solution. Also, some of them have chemical feed equipment for pH adjustment and corrosion control.

Three of the installations, which include the two deep well supplies, have facilities for disinfection and provide no other treatment. Two of the well supplies have no treatment facilities.

D. State Programs

1. Kansas

The Water Supply Program is within the Division of Environmental Health of the Kansas State Department of Health and is headed by one full time engineer with many years of experience. A second engineering position in this headquarters section is authorized and funded but the State has had difficulty in recruiting and holding qualified personnel for this position. The Division of Environmental Health also has 6 Area Offices and the Kansas City area is served out

of Topeka. Each of the Area Offices has an authorized engineering position to work on all phases of environmental health, including pollution control, in which he spends part of his time surveying public water supplies, providing technical assistance, training water plant operators, and investigating other water supply problems. Three of the Area Offices are staffed with an engineer, one is staffed with an engineer and an engineering technician, and the other two are staffed with an engineering technician. An engineer position in addition to the technician is authorized, but vacant, in the two offices staffed by technicians. It is estimated these field personnel spend less than 20 percent of their time with water supplies since at least 75 percent of their time is required for pollution control activities.

The Water Supply Program reviews all plans and specifications for new water supplies as well as the plans for any changes to existing water facilities, and issues permits for both the new facilities and the changes. The Water Supply Program has a mandatory program for the bacteriological and chemical sampling of all public water supplies (Approximately 600). Appendix D outlines the bacteriological sampling program used by the State. The analyses are done by the State Health Department Laboratory. The Water Supply Program arranges for the mailing of bottles on a weekly and monthly schedule to all supplies and maintains a surveillance program to insure that all of the supplies are submitting bacteriological samples on a regular basis. Each of the supplies must also submit a sample for chemical analysis each year. The Kansas State Department of Health has the mechanics to carry on an adequate program to insure that all of the public water supplies are properly constructed, operated, and maintained. However, due to the shortage of personnel, they are unable to provide the technical assistance and surveillance that they feel is needed to insure that all of the water supplies are properly operated. The national emphasis given to pollution is reflected in the staffing for pollution control; they have full time: 9 geologists, 7 engineers, 4 engineering technicians plus the major emphasis of the field staff. The water supply program only has 2 full time engineers plus less than 20 percent of the time of 3 engineers and 3 engineering technicians.

The State Department of Health, in conjunction with the Kansas Section, American Water Works Association and the Kansas Water Pollution Control Association, maintains a voluntary licensing program. Regional and State-wide schools are conducted and examinations given to the water supply operators to qualify them for certification. Attempts are presently underway to make the voluntary program into a mandatory licensing program in order to better insure that qualified personnel are in responsible charge of all of the public water supplies in the State.

2. Missouri

The Water Supply Program is a part of the Environmental Services Unit. The Water Supply Program is headed by an engineer with a staff of two engineers, one waterworks supervisor, and one engineering aide. The total staff consists of six positions with one vacancy; the Swimming Pool Chief and the Bureau Director spent part time on the Water Program. Missouri has a separate agency for pollution control with a professional staff of nine in headquarters and six full time professionals in the field.

It is the function of the headquarters staff to review and approve all plans and specifications for new water supplies as well as additions or renovations to existing facilities. They are also responsible for the bacteriological and chemical sampling of all (Approx. 850) public water supplies plus all other centralized functions of the Water Supply Program. Bacteriological sample bottles are shipped on weekly and monthly schedules and containers are sent for the annual chemical analyses to all public water supplies. The sampling schedule requirements are given in Appendix D. Excellent surveillance of these sampling programs is maintained to insure that all of the public water supplies submit samples on a regular basis and these records are used as a tool in conjunction with sanitary surveys to judge the safety of the supplies. All analyses are done by the Division of Health Laboratory or by other laboratories, including those at water plants that are certified by the Division of Health Laboratory Survey Officer. The Water Supply personnel are responsible for reviewing the annual survey made of all public water supplies by either headquarters, district, or local health department personnel and the transmittal of recommendations to municipal and waterworks officials where corrective measures are needed to protect the health of the people. They also provide technical assistance for the operation of water treatment facilities. In addition, they provide training courses to enable water facility operators to obtain their licenses under the voluntary licensing program operated in conjunction with the Missouri Water and Sewerage Conference. Attempts have been made in the past to institute a mandatory licensing program and efforts along these lines will be continued.

The 14 engineers 1/ in the District Offices are under the direct supervision of Local Health Services and receive technical guidance from the Environmental Services Section. They are responsible for all fields of activities in environmental control of which water supply is only one phase. It is estimated these field engineers spend 40 percent of their time working with water supplies, both public and individual. The local health department in Clay County makes surveys of all of the public water supplies within that County on an annual basis. This County Health Department and the

1/ The number of engineers in the District Offices fluctuates between 11 and 15.

Kansas City Health Department also provide laboratory facilities for the water supplies as well as some consultation concerning water supply problems.

The State Division of Health presently has a basic program to insure that all of the public water supplies are properly constructed, operated, and maintained.

3. Waterborne Disease

Both of the States have personnel responsible for collecting epidemiological data, but the data are tabulated as to the type of disease and not necessarily related to the possible cause. Both States made a search of their records for any waterborne disease outbreaks in the SMSA since 1960; none could be found. Neither of the directors of the water supply programs had any knowledge of any outbreaks in the SMSA that could be related to water. Kansas officials made a detailed investigation in April, 1969, of a hepatitis outbreak in Johnson County, but could not relate the outbreak to the water supply.

E. Areas Served and Interconnections

Map No. III outlines the areas served by the 4 major supplies in the study area. The designations include both the areas within their own system and those supplies to whom they sell water.

1. Water District No. 1 of Johnson County

This District serves all of northeast Johnson County. Their area includes 12 incorporated towns; the 2 largest are Overland Park (pop. 75,028) and Prairie Village (pop. 30,576). The District bills the customers direct and operates and maintains the entire system.

The District also sells water to Lenexa, which in turn operates and maintains its own distribution system. Previously, Lenexa purchased their water from Kansas City, Missouri; the pipeline has been incorporated into the District's system and is no longer connected to the Kansas City system.

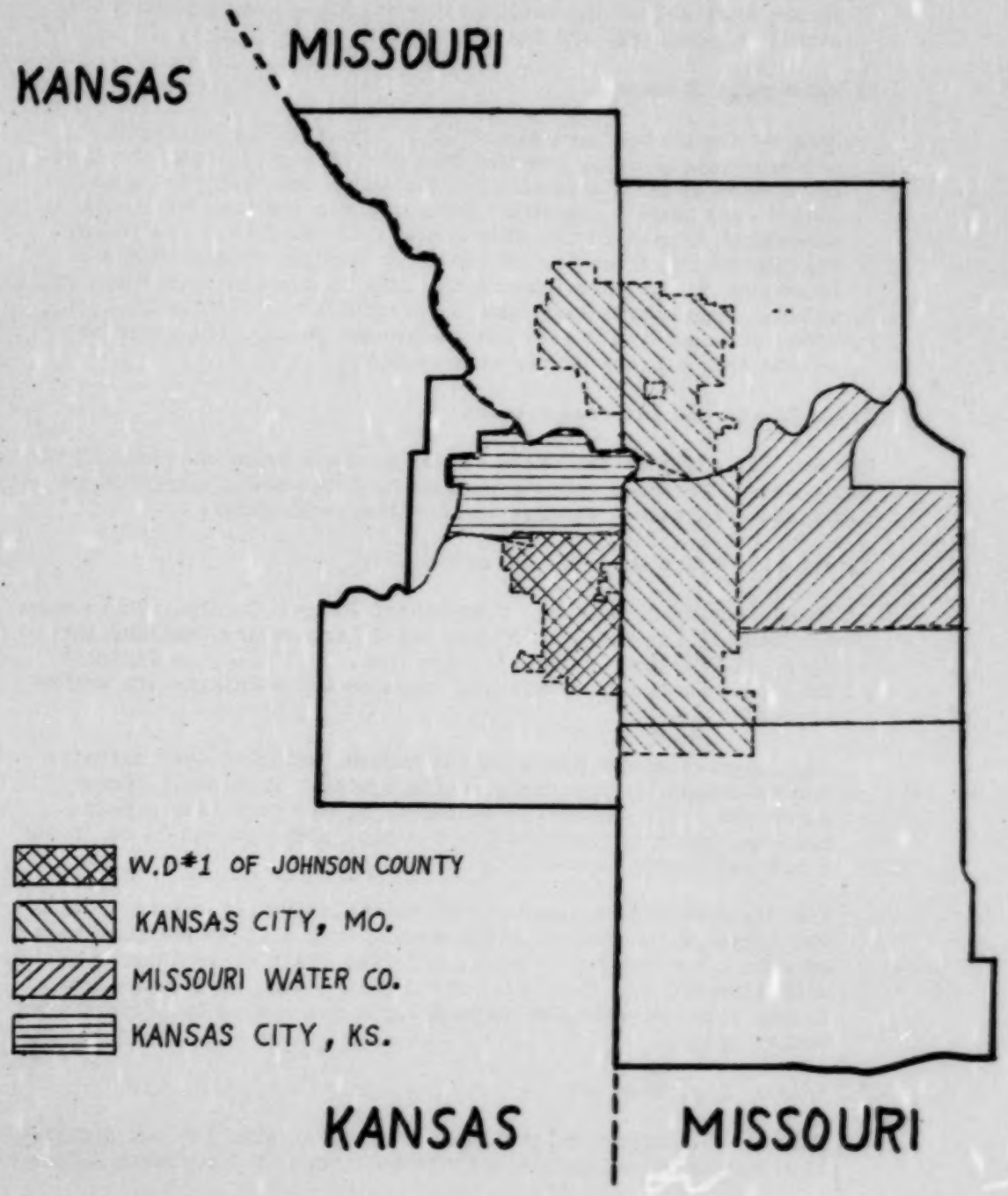
The District has an interconnection utilizing a 2-way meter with the Kansas City, Kansas supply should they need to purchase water or sell water during an emergency. The District is interconnected with Kansas City, Missouri. The District also buys water from Kansas City, Missouri to serve an area not served by their distribution system.

2. Kansas City, Missouri

This is the largest of the 4 major supplies with its own distribution system spread over a considerable part of 3 counties (Jackson

X

MAP NO. 111


KANSAS
MISSOURI
W.D#1 OF JOHNSON COUNTY
KANSAS CITY, MO.
MISSOURI WATER CO.
KANSAS CITY, KS.
KANSAS
MISSOURI

Clay, and Platte). They also provide service to a small area in Cass and Johnson Counties through their sale to other supplies. They have contracts to sell water to the following supplies who maintain their own distribution facilities:

Belton
J.C. Nichols Company (Johnson County)
Richards-Gebaur Air Force Base
Jackson County Water District No. 1
Raytown Water Company
Clay County Water District No. 2
Lee's Summit

Belton, in turn, sells water to the following who maintain their own distribution facilities:

West Belton
Lakeside Gardens Subdivision
Lazy Acres Trailer Park

Jackson County Water District No. 1 sells water to the Jackson County Water Company whose operation is in Cass County adjacent to Belton.

Lee's Summit is interconnected with the Missouri Water Company and only purchases water from Kansas City, Missouri to meet their peak demands.

3. Missouri Water Company - Independence, Missouri

This company sells water to the following supplies who maintain their own distribution systems:

Lee's Summit
Blue Springs
Buckner
Jackson County Water District No. 2
Jackson County Water District No. 8
Lake Tapawingo
Sugar Creek

Lee's Summit also sells water to the following supplies who maintain their own distribution facilities:

Jackson County Water District No. 12
Jackson County Water District No. 13
Lake Winnebago

As previously mentioned, the Lee's Summit supply is also interconnected with Kansas City, Missouri.

4. Kansas City, Kansas - Board of Public Utilities

This supply serves most of Wyandotte County. Previously 3 of the townships in the County had developed their own water systems, purchasing water from this supply and operating as independent entities. Recently, the operation and maintenance of these 3 township supplies were taken over for operation and maintenance as a part of the Kansas City, Kansas Board of Public Utilities system. This supply is also interconnected with Kansas City, Missouri and Water District No. 1 of Johnson County. They also sell water to Quivira, Inc., a private club which serves a residential area.

Map No. IV shows, in addition to the 4 major supplies, the areas served by the water districts.

5. Bonner Springs, Kansas

This supply serves most of the remaining part of Wyandotte County not covered by the Kansas City, Kansas supply. They sell water to the following supplies which operate and maintain their own distribution facilities:

Rural Water District No. 3, Johnson County
Rural Water District No. 3, Wyandotte County
Rural Water District No. 4, Wyandotte County
Rural Water District No. 7, Leavenworth County
(adjacent to Wyandotte County)

6. Olathe, Kansas

This City in central Johnson County serves the following supplies which operate and maintain their own distribution facilities:

Rural Water District No. 1, Johnson County
Rural Water District No. 4, Johnson County

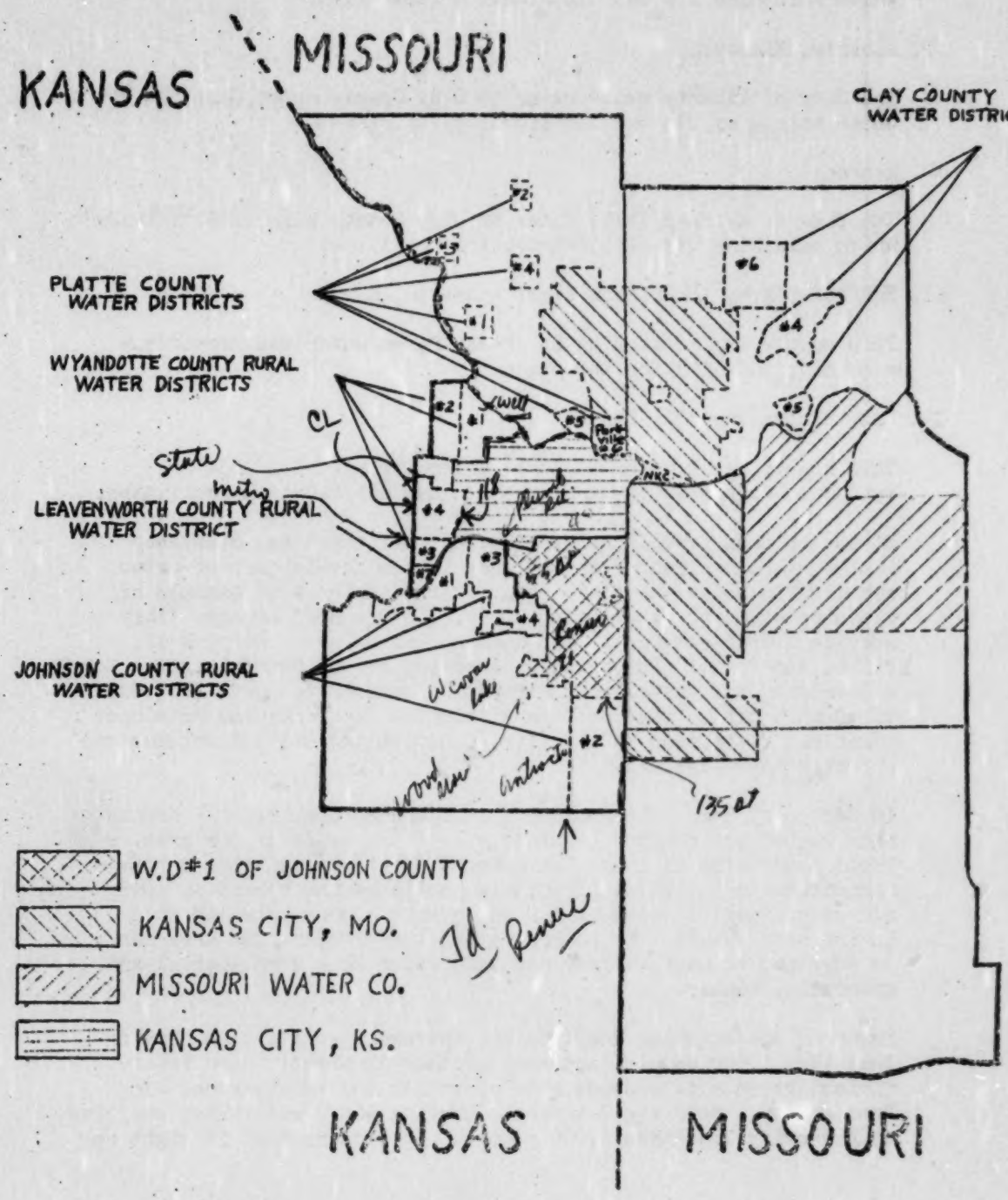
7. Missouri Cities Water Company - Parkville, Missouri

This private water company in Platte County, besides serving the City of Parkville area, also sells water to the following supplies which maintain their own distribution facilities:

Platte County Water District No. 6
Lake Waukomis
Weatherby Lake

This supply is adjacent to Platte County Water District No. 5 and actually serves some of the water customers that are within Water District No. 5's area but there is no interconnection between the 2 supplies.

MAP NO. IV


KANSAS
MISSOURI
CLAY COUNTY WATER DISTRICTS
PLATTE COUNTY WATER DISTRICTS
WYANDOTTE COUNTY RURAL WATER DISTRICTS
LEAVENWORTH COUNTY RURAL WATER DISTRICT
JOHNSON COUNTY RURAL WATER DISTRICTS
W.D #1 OF JOHNSON COUNTY
KANSAS CITY, MO.
MISSOURI WATER CO.
KANSAS CITY, KS.
KANSAS
MISSOURI

8. Weston

This supply sells water to Platte County Water District No. 3 which maintains its own distribution facilities.

9. Liberty, Missouri

The City of Liberty sells water to Clay County Water District No. 4 which maintains its own distribution facilities.

10. Kearney

The City of Kearney sells water to Clay County Water District No. 6 which maintains its own distribution facilities.

11. Sunflower Army Ammunition Plant - Desoto, Kansas

This supply sells water to Quick-Way Homes which was previously a housing facility for the plant.

12. City of Leavenworth, Kansas

This supply sells water to Rural Water District No. 2 of Wyandotte County which maintains its own distribution facilities.

It can be seen from the above listing that there has been very little overall planning in the past in the development of water supplies to serve the study area. Perhaps, the best example of planning would be Water District No. 1 of Johnson County. They provide direct service to the customer in an area covering 12 cities and towns. Prior to the creation of the Water District No. 1, a developer had installed distribution systems to serve his additions in 5 cities that are now within the District; the developer purchases water from Kansas City, Missouri and still maintains and operates these systems.

In December, 1966, the Metropolitan Planning Commission - Kansas City Region was created to study all of the needs of the area. "Metroplan" also includes Leavenworth County in addition to the 6 counties in the SMSA. They have published one report on sewer and water facility needs and plan to make a more detailed study in the near future. By incorporating these plans, the area can be served with high quality and safe water in a more logical and economical manner.

Forty of the existing supplies are extremely small, each serving less than 1,000 people, and many of them apparently have insufficient revenue to provide good operation and maintenance. In Cass County, there are 7 separate surface and 2 well water supplies, each serving less than 1,000 people. It appears that it might be

more logical to develop 1 water district to serve most of the county, including these 9 separate supplies.1/ It is understood that, at the present time, 2 small water districts have been formed in Cass County and a third is under consideration but none of them are operational; these 3 districts will only add to the existing problem of small supplies. Rural Water District No. 5 in Johnson County, which is presently under construction, will purchase water from the City of Olathe and serve an estimated 300 people.

Jackson County Water District No. 16, located in the northeast part of the County, must approve a revenue proposal before it can initiate construction and become operational. Rural Water District No. 2 of Johnson County has more requests for service than it can supply; they are considering the purchase of water from the Olathe supply. Since the survey, the Board of Public Utilities in Kansas City, Kansas has assumed the obligations of Rural Water District No. 1 of Wyandotte County and has taken over these facilities; this eliminates 1 supply with its iron treatment plant that served less than 1,000 people.

There are 25 water districts in the study area serving rural and semi-rural areas. Sixteen of these each serve less than 1,000 people. Only 8 of the 25 have their own water treatment facilities, but 6 of these 8 are in the group that each serve less than 1,000 people. Many of these supplies were built with loans from the Farmers Home Administration (FHA). The development of a water system to serve a rural area on an economical basis is difficult since the houses are far apart and the number of customers is usually quite limited. The FHA allows the engineer to design on the basis of only 30 gallons per capita 2/ per day with a distribution system that provides little to no allowance for future growth or the customary piping and pumping capacity for fire protection. As a result, many of these rural systems are made up of small sized pipe. Also, the revenue may be so limited that they cannot hire full time personnel to adequately operate and maintain the facilities. With proper planning, many of these districts can be incorporated into existing larger water supplies in the future; this is being done to a limited extent.

1/ Such a district could provide a centralized arrangement for maintenance, operation, and billing and, as it becomes feasible, initiate a program to interconnect the systems and develop centralized treatment facilities.

2/ Missouri requires the design be based on 60 gallons per capita per day. Also, other design requirements are in excess of the FHA minimum standards.

F. Operation

1. Personnel

Water treatment and distribution facilities are designed to deliver a safe water of acceptable quality to the customer any time of the day in any quantity within reason. The safeguards these design considerations provide may be lost or minimized if the facilities are not properly operated. The operator must be a trained individual who understands not only the mechanics of his job, but realizes that the quality and safety of the water provided the people of his community depend upon him.

In Table VII, it will be noted 75 percent (30) of the 40 supplies serving less than 1,000 people are operated by part time operators.1/ In many of the small towns, the water plant operator is also responsible for the operation of the waste treatment plant, maintenance of streets, and various other city operations. A few of the water treatment plant operators had full time jobs in towns other than where they live and operate the water facilities. In a few towns and districts, the person responsible for the operation of the water treatment plant was also responsible for the operation and maintenance of the distribution system, reading the water meters, preparing the bills, and making collections. Many of these operators are very dedicated individuals who are willing to work 12 to 16 hours a day and who stay at the plant to treat water for 2 to 3 hours at a time for as many times each day as is needed to meet the water demand. It was found that some plants are left on automatic control with no one present while the plant is running; this type of operation is quite hazardous since it is possible for the equipment to malfunction and contaminated water could be spread in the distribution system before anyone was aware of the situation.

Only 4 or 10 percent of these supplies had certified operators which indicates that many of the supplies are being operated by personnel with inadequate qualifications. In many of these towns and districts, there is but one "water man" and it is difficult for him to travel any distance for training. This, coupled with only voluntary certification programs and the shortage of public health engineers and/or other qualified training personnel in both States, severely limits the training of those operators in this category.

1/ A part time operator is defined as a person who has other duties in addition to the operation of a treatment plant or maintenance of a distribution system with no treatment facilities. Other duties include responsibility for other city or district operations or full time employment on a second job.

Table VII

OPERATING PERSONNEL
for
SUPPLIES SERVING LESS THAN 1,000 PEOPLE

Type of Supply	No. Supplies	Pop. Served	Operator		State Certified Operator		Years of Experience			Water Supply Training					Annual Salary in $1,000			
			Part Time	Full Time	Yes	No	0-5	6-10	>10	None	Sh't Schl	Col-lege	On Job	Trade Schl	<1	1-2	2-5	5-75
Surface	11	6,194	7	4	2	9	8	2	1		1		9	1	1	3	2	5
Well: Iron Removal	9	3,726	7	2	2	7	7	2		2	3		3	1	3	4	2	
Well: Chlorination	3	1,429	3			3	3			2			1		4	6	1	
Well: No Treatment	2	310	2			2	2			2					3			
Finished Water System Only	15*	6,879	11			11	9	2		9	1		1		2			
TOTAL	40	18,538	30	6	4	32	29	6	1	15	5		14	2	13	13	5	5

* One system operated by volunteers
Two systems indicated they did not have an operator
One system - no data obtained

As for training, 15 (38 percent) of them had had no training and only 5 (13 percent) had even been to a short school. These small supplies have a difficult time retaining personnel for any length of time since 29 (73 percent) of the operators had less than 5 years' experience. The salaries being paid for the operation of these small supplies is very poor since two-thirds (26) of them pay less than $2,000 per year. None of them pay more than $7,500 per year. In general, it can be stated that the small supplies are operated by poorly paid, untrained operators on a part time basis with a high rate of turnover in employment. Were it not for the built-in protection coupled with the bacteriological and chemical surveillance and the dedicated and conscientious people in many of the communities, the situation would be much worse. In some of these small communities where there is but one operator, difficulties arise when he is ill or out of town. Two of the surveys were postponed since the single operator was on vacation and reportedly no one else was familiar with the supply. A trained back-up operator is essential.

In Table VIII for those supplies serving between 1,000 and 5,000 people, the situation has improved considerably over the data shown in Table VII in that about half of the operators are hired on a full time basis. Approximately one-third are certified and, in general, the pay is better, there is a higher degree of training, and the retention on the job is better than is shown in Table VII. For those supplies serving between 5,000 and 25,000 people, only 3 (distribution systems) are operated on a part time basis by non-certified personnel. Only 1 of the operators has had no training and all of the salaries but 1 are above the $5,000 per year level and with 7 of them being paid over $7,500 per year.

In Table IX it should be noted that the 4 major supplies are able to employ and retain qualified personnel. The personnel shown here are in supervisory positions and all but 1 are paid in excess of $10,000 per year. These supervisors sponsor in-plant training courses and support the State training programs to insure that their operators are qualified to operate their treatment facilities.

The summary of Tables VII, VIII, and IX show that only 35 percent of the supplies are operated by a full time operator and that only 26 percent (23) of the supplies have certified operators. Twenty-five percent of the supplies are operated by personnel with no training. Over one-third of the supplies paid less than $2,000 per year to the person in responsible charge of their water supply.

The operators interviewed gave some recognition to their inadequacies since 23 (26 percent) stated they had an insufficient number of operators. Only 11 (13 percent) indicated the quality of the operators as to training and education was inadequate. These replies also indicate that some of the water supply officials are not aware of the possible hazards of operating with untrained part time personnel.

Table VIII

OPERATING PERSONNEL
for
SUPPLIES SERVING BETWEEN 1,000 AND 5,000 PEOPLE

Type of Supply	No. Supplies	Pop. Served	Operator		State Certified Operator		Years of Experience			Water Supply Training				Annual Salary in $1,000					
			Part Time	Full Time	Yes	No	0-5	6-10	>10	None	Sh't Schl	Col-lege	On Job	<1	1-2	2-5	5-75	75-10	>10
Surface	10	25,421	2	8	3	7	4		6		9		1			2	6		2
Well: Iron Removal	6	11,400	4	2	2	4	3	1	2	1	2		3		1	1	3	1	
Finished Water System Only**	13	25,915	8	2	1	9	5	3	2	5	1	1	3	2	1	1	4	2	
TOTAL	29	62,736	14	12	6	20	12	4	10	6	12	1	7	2	2	4	13	3	2

** Three systems - no data obtained

OPERATING PERSONNEL
for
SUPPLIES SERVING BETWEEN 5,000 AND 25,000 PEOPLE

Type of Supply	No. Supplies	Pop. Served	Operator		State Certified Operator		Years of Experience			Water Supply Training					Annual Salary in $1,000				
			Part Time	Full Time	Yes	No	0-5	6-10	>10	None	Sh't Schl	Col-lege	On Job	Other	1-2	2-5	5-75	75-10	>10
Surface	1	15,000		1	1				1		1							1	
Well: Iron Removal	6	71,100		6	6				6		5	1				1	3	2	
Finished Water System Only***	8	110,200	3	2	2	3	2		3	1	1		2	1			1	2	2
TOTAL	15	196,300	3	9	9	3	2		10	1	7	1	2	1		1	4	5	2

*** Three systems - no data obtained

Table IX

OPERATING PERSONNEL
for
SUPPLIES SERVING OVER 100,000 PEOPLE

Type of Supply	No. Supplies	Pop. Served	Operator		State Certified Operator		Years of Experience		Water Supply Training		Annual Salary in $1,000	
			Part Time	Full Time	Yes	No	6-10	>10	Sh't Schl	College	5-75	>10
Surface	3	989,923		3	3			3	2	1	1	2
Well: Iron Removal	1	116,000		1	1		1			1		1
TOTAL	4	1,105,923		4	4		1	3	2	2	1	3

SUMMARY OF TABLES III, IV, AND V

Category	No. Supplies	Pop. Served	Operator		State Certified Operator		Years of Experience			Water Supply Training						Annual Salary in $1,000					
			Part Time	Full Time	Yes	No	0-5	6-10	>10	None	Sh't Schl	College	On Job	Trade Schl	Other	<1	1-2	2-5	5-75	75-10	>10
Serving: Less than 1,000	40	18,538	30	6	4	32	29	6	1	15	5		14	2		13	13	5	5		
1,000 to 5,000	29	62,736	14	12	6	20	12	4	10	6	12	1	7			2	2	4	13	3	2
5,00 to 25,000	15	196,300	3	9	9	3	2		10	1	7	1	2		1			1	4	5	2
Over 00,000	4	1,10>,923		4	4			1	3		2	2							1		3
GRAND TOTAL	88	1,383,497	47	31	23	55	43	11	24	22	26	4	23	2	1	15	15	10	23	8	7

2. Maintenance

Item 9A(6) on page 5 of the form ECA-19 (Appendix C) asked for an evaluation of the maintenance program for each supply.

On the basis of the inspecting engineer's observations, 18 of the supplies were marked as having an inadequate maintanance program; 11 of these were in the small supply category with each serving less than 1,000 people. Most of them needed to clean up, repair, and paint their facilities. A number of them contracted for repairs, but had no regular preventive maintenance program. One operator was so busy with other jobs he didn't have time to clean the sedimentation basins even though they had dual basins and each was over one-half full of sludge. One of the special supplies that hauls its water had a tank truck in such bad shape that someone had to stand on the discharge pipe to reduce the leakage to keep from losing all the water they were transporting. In a few cases, the operator had no pride in his job or the facilities.

All 4 of the major supplies and a few of the others had regular preventice maintenance programs. From all appearances, they take excellent care of their facilities.

3. Cross-Connection Control

A cross-connection may exist for years with no adverse effects but when there is a reduction in pressure in the safe supply piping system, the backflow of contaminated material into the water system may and can produce spectacular public health problems.

Item 9A (8) under Source, Treatment, and Distribution, "Cross-Connection Control" asked if the organizations had an "(a) ordinance, (b) program implementation, and (c) progress." Forty-four percent (39) of the cities and districts had an ordinance 1/ or equivalent regulation to control cross-connections but only 10 percent (9) had implemented a program. Less than seven percent (6) were able to demonstrate any progress with a program to find and eliminate existing cross-connections.

In addition to this data, one of the field engineers spent one day with each of the four major supplies, interviewing the personnel directly responsible for cross-connection control activities; he also accompanied these people on a brief cross-connection survey of a number of installations, such as hospitals, mortuaries, plating plants, and other facilities. Cross-connections were found in each of the four areas inspected.

1/ The water districts in Missouri do not have the authority to pass ordinances, but can adopt rules and regulations which many have done.

In general, the water supply organizations in this area have not shown enough interest in the location and elimination of cross-connections. The survey form data indicate practically none of the supplies have an active program. The brief visual inspection demonstrated that hazardous conditions do exist. No doubt, hazardous connections exist in the smaller supplies since their resources for such programs are more limited than those found in the large supplies.

4. Laboratory Control

Forty-seven of the supplies have treatment facilities for surface and/or well water. The Form ECA-18 (Appendix B) indicates 21 (45 percent) of the 47 have laboratories for chemical analysis and seven (15 percent) have bacteriological laboratories. Twenty-five of the plants with no laboratory do run, at least, daily tests for chlorine residual and pH which are done with comparator kits.

Only one supply indicated they ran only a chlorine residual test on an infrequent basis.

All four of the major supplies using river water have complete laboratories for both chemical and bacteriological testing.

The Missouri Division of Health regularly inspects and certifies the following bacteriology laboratories in the study area: the Kansas City, Missouri Water Company, Liberty and Gladstone Water Plants, and the Kansas City and Independence Health Departments. Kansas inspects and certifies those laboratories that are required to run more than 416 samples per year. Of the three remaining bacteriological laboratories, two serve Federal installations.

The tabulation of the results for question 6B (5), "Tests run for operational control and their frequency are:" indicated the frequency of laboratory tests. The most frequently run analyses are chlorine residual (52 or 59 percent) and pH (43 or 49 percent) which are of importance to all 88 supplies although the distribution system supplies would be expected to make such tests on an infrequent basis. Twenty-two of the supplies have iron removal treatment equipment, but only 14 (64 percent) run iron analyses 1/ since four of 18 doing iron analyses are surface supplies.

In general, it is evident that only the moderate or larger supplies have the personnel, equipment, and resources to conduct an adequate laboratory control program. The small supplies do not have adequate laboratory facilities and depend upon the State Health Departments' laboratories for the weekly and monthly bacteriological samples and annual chemical analyses to evaluate the adequacy of their treatment and safety of the water furnished their customers.

1/ Missouri requires all iron removal plants to have testing equipment for iron determinations.

5. Records

All of the supplies should maintain records pertaining to the quantities of water treated or bought and the amount that is sold, used for public purposes, or unaccounted for. Forty-seven of the supplies have treatment facilities which include chlorination, while an additional three supplies provide only chlorination. All of these 50 should be maintaining records of their treatment operations, not only for cost purposes, but also to have an evaluation of how their plant is functioning relative to the other time periods, such as last month, last year, etc. Question 9A (7) in the Form ECA-19 pertains to five categories of records; that is, (a) disinfection, (b) filter runs, (c) chemical consumption, (d) operational control tests, and (e) bacteriological examination. Thirty-nine (78 percent) of the 50 supplies maintain records pertaining to disinfection so they can compare the amount of chlorine used during any particular time. Thirty-five (74 percent) of the 47 supplies using filters maintain operational data which are most important in evaluating the efficiency of the treatment units ahead of the filters. Thirty-five (74 percent) of the 47 maintain records pertaining to the amount of chemicals consumed or used in their treatment processes. Thirty-seven (79 percent) of the 47 supplies maintain operational control test records which are useful as a reference during times of water quality changes. All 88 of the supplies should be maintaining a bacteriological record; this record evaluates the safety of the water being supplies to the public. The operator should maintain and be familiar with their bacteriological records. Only 51 (58 percent) of the supplies maintained a satisfactory permanent record of their bacteriological examinations.1/ In addition, 22 of the supplies had been submitting bacteriological samples but were not maintaining records of the sampling results and 15 of the supplies were not collecting bacteriological samples.

Again, it can be stated that the larger supplies provide excellent records in all of the above mentioned fields since they find them most important as reference material in the operation of their treatment facilities. Most of the other larger supplies maintain adequate records but, again, the smaller supplies quite often maintain very meager to no records at all.

6. Safety

In the past, the safety record in the waterworks field has shown a higher incidence of worker accidents than will be found in other similar fields. The American Water Works Association has been placing additional emphasis on this phase of waterworks operation in hopes that the safety record can be improved. Question 8G in Form ECA-19 inquired into two phases of safety: (1) the adequacy

1/ For good samples, Missouri sends the supply a quarterly summary of their samples they submitted. Missouri does send out special sample results upon completion of the analysis.

of facilities to prevent personal accidents, and (2) if adequate precautions were taken to prevent chlorine accidents. Fifty-six (64 percent) of the 88 supplies were judged to keep their facilities in an acceptable manner that would prevent personal accidents. Included in this evaluation was the general housekeeping practices since an improperly kept plant could be the cause of personal accidents. Twenty-nine (58 percent) of the 50 supplies using chlorine were judged to be taking adequate precautions to prevent accidents. These precautions would include a separate room for the chlorinator with an exhaust fan 1/ maintained at floor level and an updated gas mask stored conveniently but not inside of the chlorine room. Also, it was noted that if the supply used tall slender gas chlorine cylinders, they should chain the cylinders to prevent them from falling and breaking the chlorine gas connection. A number of the installations did not chain their cylinders. At least 5 of them had no exhaust fan and at least, in 1 case, there was not a separate room for the chlorinator and gas cylinders.

In general, the larger supplies had well kept facilities and were cognizant of taking the proper preventive measures to reduce accidents from normal operations and in the handling of chlorine gas. The worst housekeeping practices were found in the smaller plants which, in most cases, have only 1 person who is responsible for many other duties besides those at the treatment plant. In some cases, these small plants are in rather isolated areas and if the operator were to be severely injured, it is doubtful if he would receive any assistance within a short interval of time.

7. Operating Problems

Question 81 of the Form ECA-19 inquired as to the operating problems most often encountered by the operators. Taste and odor control was the most frequently reported problem since 22 (88 percent) of the 25 plants treating surface water reported that they have problems. None of the operators reported problems with phenols and only 1 indicated difficulty with corrosive waters. Eight of the 47 treatment plants indicated difficulties with short filter runs. Twenty-nine operators indicated the following to be their most pressing operating problems:

Treatment Plant	Wells and Distribution Operations
Iron and manganese in water(5)	Breaks in old water mains (3)
Flocculation and settling problems	Breaks in PVC lines
Color (2)	Leaks in the system (2)
Inadequate quantity of raw water	Lightning
Operational control equipment	Bill collecting
Turbidity	Frozen meters
Lime sludge disposal	Fluctuation in demand
Iron coating filter sand	

1/ Missouri requires a separate room and gas mask, but does not require an exhaust fan except for below ground level installations.

Some of the problems listed above come within the category of problems over which the operator has little control. However, many of the problems indicate that additional training of operators and improved laboratory control would be helpful.

Many of the taste and odor problems, particularly those from reservoirs, are indicative of operational problems. Some of the taste and odor problems are indicative of a research need. The waterworks industry should have some type of continuous monitoring device that will not only alert the operator of a pending taste and odor problem but will also give him sufficient data so he may institute the proper treatment measures to alleviate the situation in the plant, thus alleviating the complaints from the public. While the Missouri River Public Water Supplies Association has given considerable study to tastes and odors, the problem is national in scope and should be given major research attention.

Twenty-eight of the 88 supplies gave no answer to the question pertaining to operational problems.

G. Complaints

Questions 10B, C, and D in the Form ECA-19 pertained to the biggest and most frequent complaints on the part of the operator, the customer, and management. In most cases, the information was provided by the responsible operator in charge. Twenty-three (26 percent) of the 88 supplies indicated they had no complaints in any of the 3 categories, while 6 more provided no data. The following data is based on 59 (67 percent) of the supplies.

1. Operators' biggest complaints

Previously, operating problems were discussed and, in some cases, the operating problem is also the operator's biggest complaint. The following complaints reflect the operators' concern relative to pay, training, and working conditions:

Not enough money (6)
Night work
Personnel not qualified
Too much to do for a part time job
No laboratory facilities
Poor vision
Need more men (3)
Too many other duties
Turnover of personnel
Need full time operator
No cooperation from the board

The following operator complaints pertain to equipment:

Poor reliability of control valves
Inadequate equipment
Need more equipment for maintenance and repair
Old plant hard to operate
Consulting Engineer doesn't follow operator's suggestions for new plant construction
Management's attempt to automate the plant which will create a flood hazard without an operator
Valve problems
Inadequate lines
Not having parts
Breaks in old and PVC lines
Electrical controls and plant damage from moisture

The following complaints are of a general nature:

Collecting bills
Leaks in customers' houses
Leave water running (trailer park)
Not enough pressure (from primary source)
Plant capacity
Algae

2. Consumers' acceptance

As might be expected, most of the customer complaints pertained to the rates and high bills. Also, the customers are concerned about the quality of the water and the service as indicated below:

Water bills too high (16)	Chlorine taste (8)
Complaints about bill (2)	Taste and odor (4)
High rates (2)	Color (2)
Pressure	Chlorine kills fish
Shut down for breaks	Iron and Manganese
Frozen meters	Dirty water
Breaks	Salt taste
Leaks	

A brief check indicates there is little relationship between the complaints and the rates charged since some of the supplies with the lowest rate indicate their customers complain about high bills. It appears the operators and management need to improve their educational program to demonstrate to the customers the value of their water service.

3. Management's most frequent complaint

Most of the complaints in this category pertain to costs and revenue which are as follows:

Insufficient revenue
Expense of needed improvements
Squeeze between cost of production and selling price
At the mercy of Kansas City, Missouri for cost of water
Cost of Bonner Springs water
Rate increase by Bonner Springs
System growing too fast
System out-dated
No operator
Lime sludge disposal
Insufficient water during peak periods

H. Water Usage and Rates

All but 5 of the 88 supplies provided information regarding present water demands (question 4, Form ECA-19), but less than one-third provided any estimates for 10 years in the future. Table X is a tabulation for 79 of the supplies by population groupings. There is a considerable variation (range) in the per capita water usage but the averages indicate the lowest usage in the less than 1,000 population grouping. The highest usage is in the 2 Kansas Citys and reflects the industrial water demand. Four of the supplies with much higher per capita usage were not included in the tabulation since they represented special conditions. Five supplies had no estimate of their water usage.

The price charged the retail customer was tabulated under question 11-I, Tariff, in the Form ECA-19. The price for 3,000 gallons was used as a comparison of the cost to the customer. Table XI gives a comparison of the cost by the population groupings. The highest price was $17.50 for 3,000 gallons in 1 of the rural water districts and $1.20 was the lowest for 1 of the major supplies. In general, the customers of the supplies serving less than 1,000 people pay more for their water. Part of this is reflected by the development of the rural water districts where there are a limited number of customers to pay for an extensive distribution system.

Graph 1 provides a comparison of the average water usage with a median of the cost for 3,000 gallons for the various population groupings. In general, the customers served by the less than 1,000 population supplies use less water and pay a higher rate. This group includes those rural water district supplies that provided data. Of the four major supplies, Water District No. 1 of Johnson County has the lowest per capita usage (83 gallons per capita per day) and the highest water rates ($6.50); the probable reasons for this difference are that the District is primarily a residential area and secondly, it is the newest of the four with construction of a

Table X

WATER SUPPLY USAGE

Population Group	No. of Supplies	Population Served	Average Water Demand M.G.D.*	Water Usage	
				Average GPCD**	Range GPCD**
Less than 1,000	34	17,753	1.0218	58	26 - 163
1,000 to 5,000	28	59,236	4.757	80	19 - 150
5,000 to 25,000	13	183,300	15.590	85	56 - 142
Over 100,000	4	1,105,923	155.820	141	83 - 177
Sub-total	79	1,366,212	177.1888	130	
The following supplies with high per capita usage were not included in the above tabulations:					
Federal Installation	1	3,500	5.9	1700	
Federal Installation	1	7,000	2.8	400	
Industrial Area	1	6,000	3.33	555	
Small Community	1	137	0.075	547	
Total	83	1,383,497	189.2938		

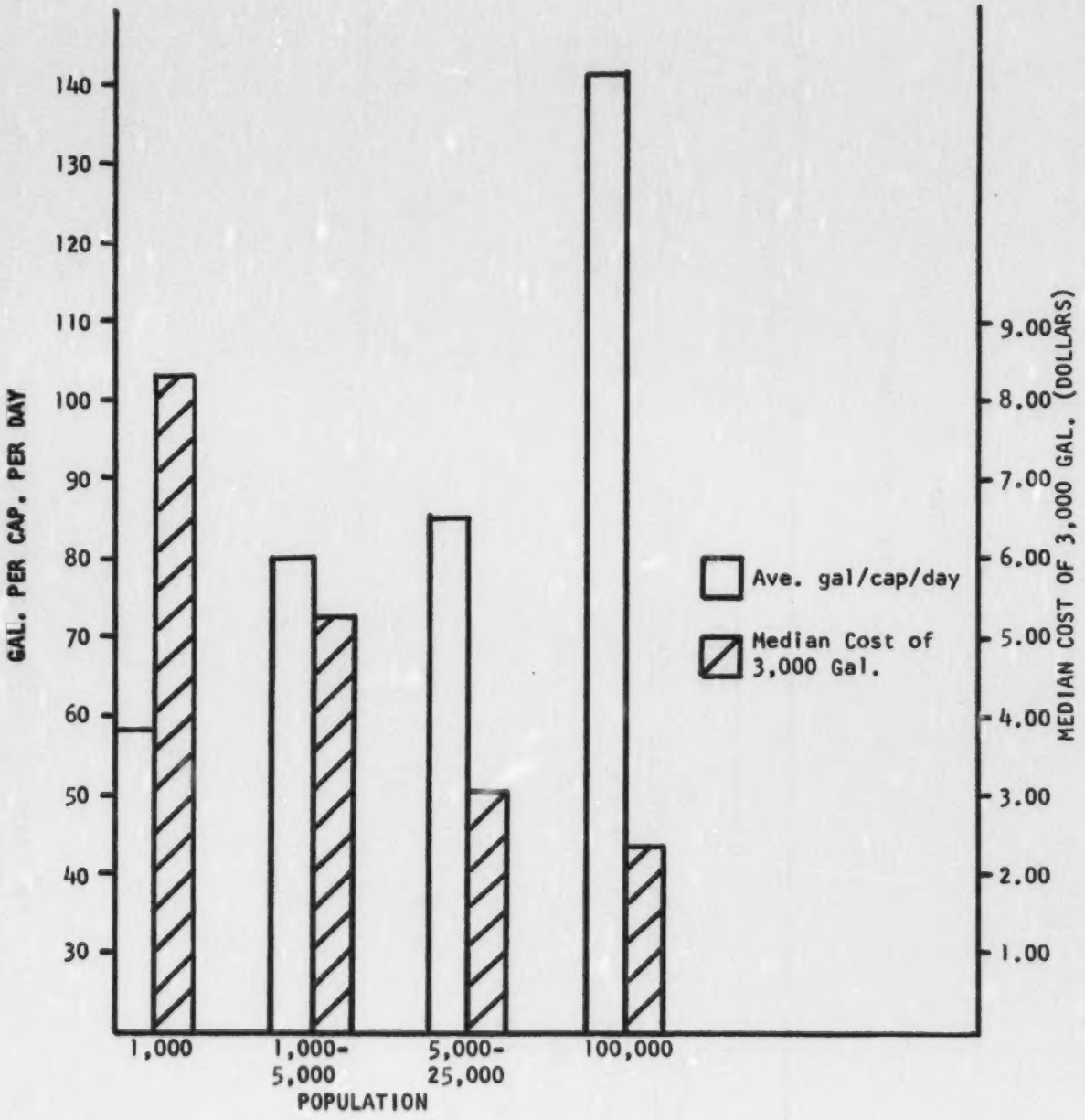
* Million gallons per day
** Gallons per capita per day

Table XI

RETAIL COST OF WATER

Population Group	Total No. Supplies	Cost of 3,000 gallons of water							
		No. Supplies	$2.50 to $5.00 Percent	No. Supplies	$5.00 to $7.50 Percent	No. Supplies	$7.50 to $10.00 Percent	No. Supplies	More than $10.00 Percent
Less than 1,000	36	4	11.1	12	33.3	12	33.3	8	22.3
1,000 to 5,000	26	13	50	5	19.2	5	19.2	3	11.5
5,000 to 25,000	15	12	80	3	20	0	----	0	----
Over 100,000	4	3	75	1	25	0	----	0	----
Totals	81	32	39.5	21	25.9	17	21	11	13.6

GRAPH I
USAGE & MEDIAN COST OF 3000 GAL.



large treatment plant and an extensive distribution system within the past few years.

Graph II is a comparison of the connection fees (question 11-I) charged by the population groupings. Sixty-six of the supplies charged a connection fee that varied between $1.06 and a maximum of $350.00. An additional 10 supplies charged the actual cost. The graph shows that, on the average, the customers served by the smaller supplies pay the highest connection fee.

Production cost data were requested in question 11-H and information was obtained from 49 supplies. Production costs are based on the unit cost to treat 1,000 gallons and does not include the cost of distribution to the customer. Most of the distribution system supplies were aware of the price they paid the primary source for water, but many of the small supplies treating their water had no idea what their cost of production was nor had made any estimate. Graph III is a comparative cost to treat water and/or purchase water for distribution by the population groupings. The graph shows the average cost for those supplies treating their own water, purchasing their finished water, and a combination of the 2 for each of the groupings. Based on the limited data from the small supplies, it appears the cost is less for those supplies that purchase their water than those that operate their own treatment plants.

I. Planning

Forty out of 81 supplies indicated they were actively planning. Thirty projects with a combined estimated cost of $29,593,600 were tabulated.

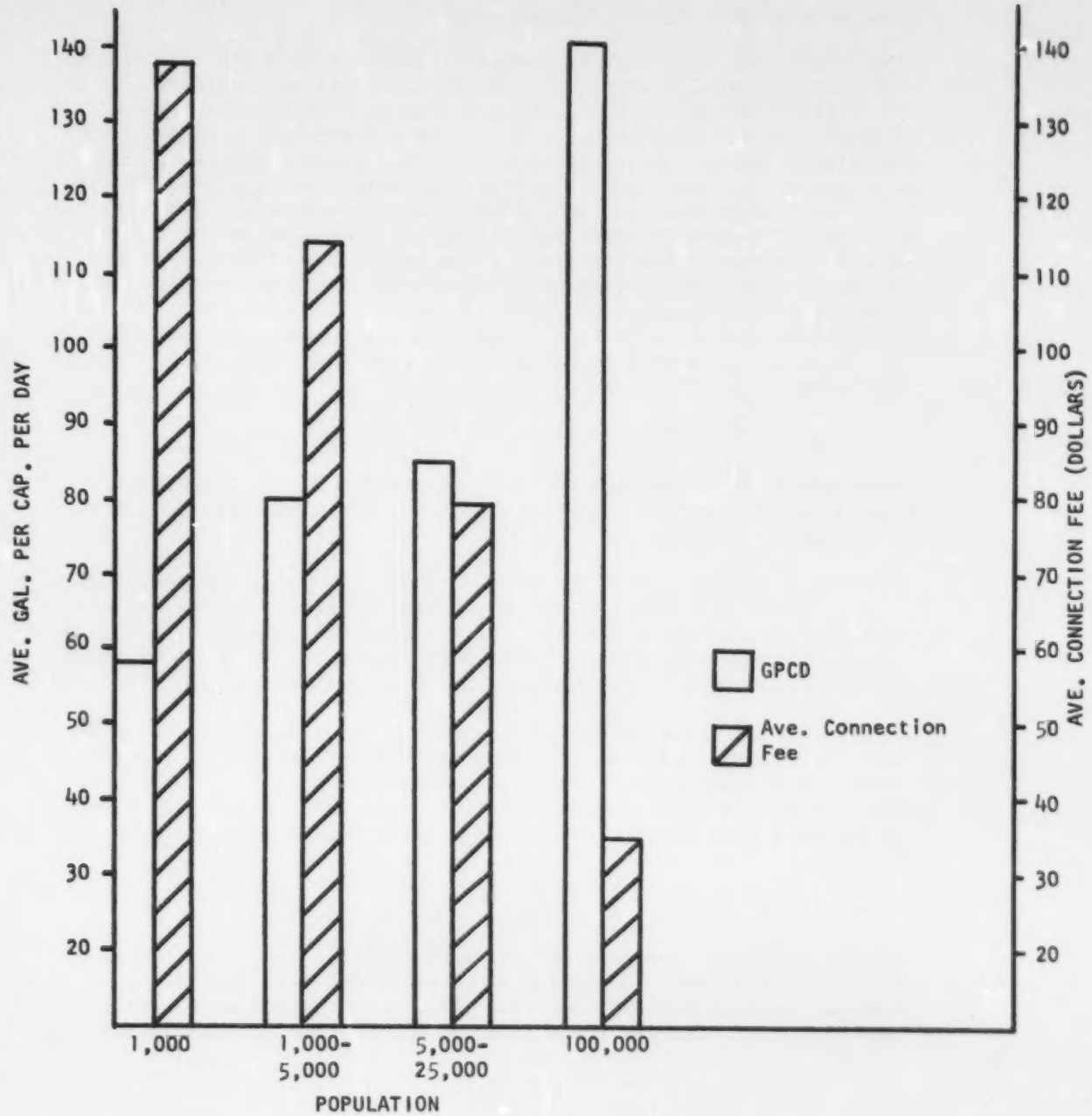
Question 5 inquired as to restricted water use during the past five years. Three supplies had restricted use two times and ten had restricted use only once. A total of 340 days of restricted use was listed of which one supply accounted for 180 days. None of the supplies indicated restricted use at the time of the survey.

The recently created Metroplan can provide the leadership needed to develop a logical plan to provide quality water service to the entire area. To accomplish this, the interest and cooperation of the waterworks officials must be obtained. The public must also be shown and convinced that a regional approach to water supply service is to their benefit.

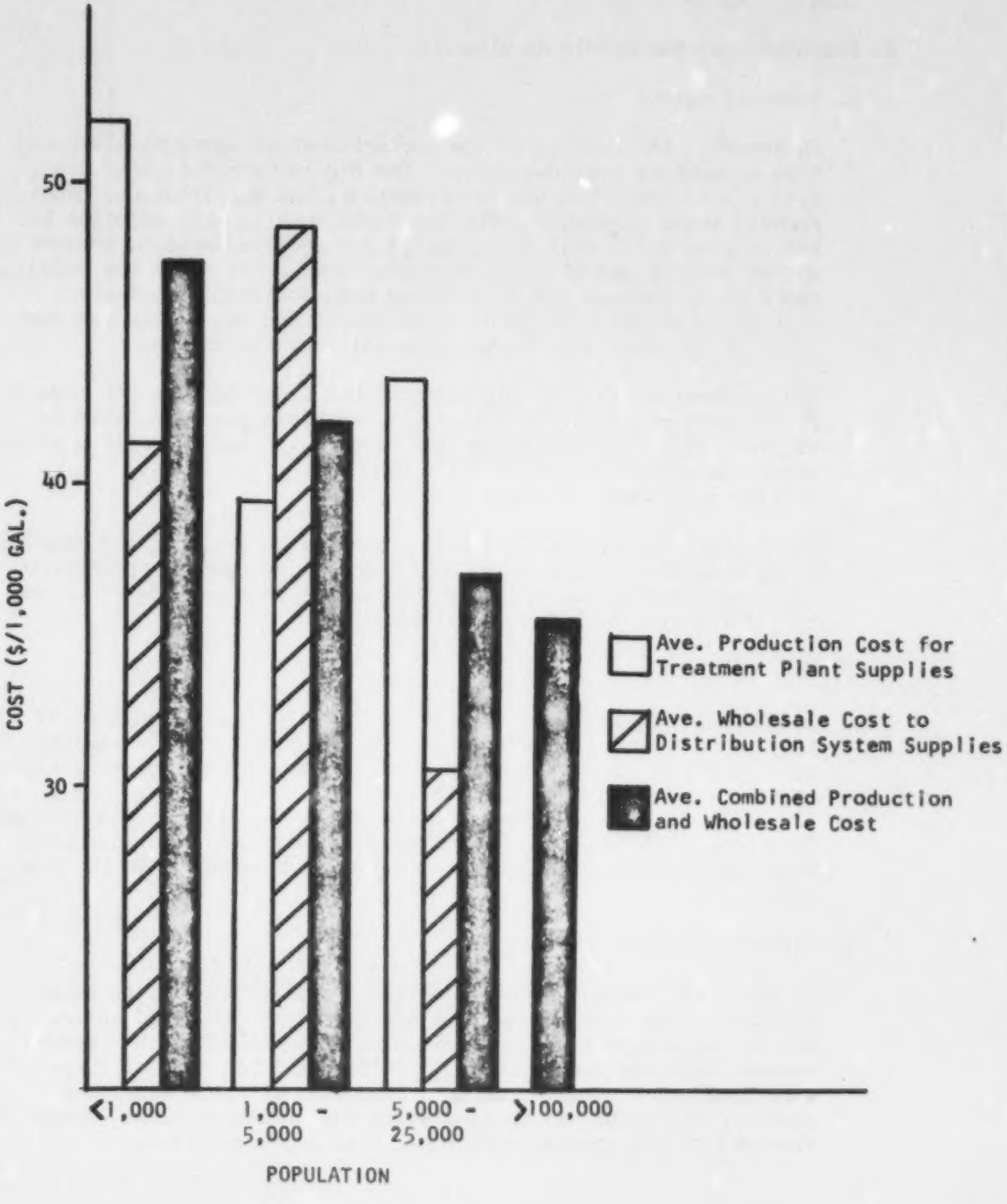
J. Fluoridation

Sixteen community supplies and one special supply practice fluoridation serving a combined population of slightly less than 400,000 people. Half of the supplies have equipment to add fluoride while the other half purchase their finished water that has been fluoridated.

GRAPH II
CONNECTION FEE & WATER USAGE



GRAPH III
AVERAGE PRODUCTION & WHOLESALE COST



Two of the major supplies, Water District No. 1 of Johnson County and Kansas City, Kansas, fluoridate. Based on the average temperature, the recommended fluoride concentration for this area is between 0.7 and 1.2 mg/l. The results of the samples collected during the survey came within this range except for one small community supply and the special supply that had concentrations less than 0.7 mg/l.

K. Discussion of the Sample Results

1. Bacteriological

In general, the results of the bacteriological sampling indicated that no serious problems exist. The highest verified total coliform counts came from the river samples, but the treatment plants removed these organisms. The two small special well supplies had bad samples which would be expected for supplies with no treatment and no regular surveillance program. Neither of these two supplies has a State permit; one of them has been notified that their facilities do not meet State requirements and the matter has been referred to the County Prosecuting Attorney for action.

Two hundred and four of the 239 finished water samples did have a plate count ranging from 1 to 9,999 organisms per milliliter of sample. This high percentage (85 percent) of samples with a plate count was not expected; an evaluation of the public health significance of these counts should be made.

The States' requirements for the number of bacteriological samples to be submitted by the water supplies are included as Appendix D. Also, both States require that the hydrant be flamed prior to the collection of a bacteriological sample.

2. Wet Chemistry

In general, the chemical quality of the water, as determined by the wet chemistry analyses, was good. Only one small community well supply had a very poor chemical quality water; however, this is the only water source available at the present time. One of the small special supplies slightly exceeded the nitrate standards. This supply also had bad bacteriological samples, which combined with the nitrates, could be an indication of sewage entering the well.

3. Carbon Chloroform Extract (CCE)

Twenty-three carbon filters were installed at the surface water treatment plants to collect CCE samples of the finished water. Six of the analyses had CCE concentrations exceeding the recommended limit and ranged from 203 to 560 ppb. All six of these were from small supplies using a reservoir as their raw water source. Since CCE can be removed in the treatment plant, these six need to incorporate additional treatment facilities.

4. Pesticides

Samples of finished water were collected at the 25 surface water treatment plants for pesticide determinations. Analyses were made for ten different pesticides. From one to six different pesticides were detected in 19 of the samples, but none of the concentrations were above recommended limits. On the basis of these analyses, there is not a pesticide problem in drinking water in this area.

5. Radiological

Only one out of 58 samples collected for radiochemical analyses had sufficient activity to receive additional testing. This one sample contained 4.3 pCi/liter of Radium-226 which exceeds the recommended limit of 3.0 pCi/liter. The sample came from the one small well supply with poor chemical quality. If there are other sources of radioactivity in this community, then an evaluation should be made of the combined effects of the sources of radioactivity upon the citizens.

6. Trace Elements

Fourteen samples from distribution systems had high iron content which indicates either a variation in the quality of water produced at the treatment plant or the water is corrosive and removing iron from the pipe. High iron content was found in three treatment plants and this could account for three of the high distribution system samples, but only for two systems. Twelve samples from distribution systems and five samples from treatment plants exceeded the recommended limit for manganese. Six of the distribution system samples came from three of the treatment plants with excessive manganese. Eleven system samples and two plant samples exceeded the recommended 1.2 mg/l concentration for fluorides used for this study; eight of these samples can be attributed to one supply.

All but three fluoride samples had a concentration of 1.30 mg/l or less and are not considered a problem. The three samples with 1.34 mg/l of boron, all from one supply, exceed the 1.0 mg/l recommended level. The four samples with excess lead and the one sample with excess copper could be indicative of corrosive water, although the use of lead pipe for water has been discontinued for years.

One distribution system sample from a school had the following elements that exceeded the limits: copper - 1.72; manganese - 1.32; lead - 0.79; and iron - 0.745 mg/l while the treatment plant only showed an excess of 1.33 mg/l of manganese. Perhaps an investigation should be made to determine if any cross-connections exist in the school.

In general, the excessive amounts of iron, manganese, and fluoride are indicative of the need for closer control measures in the treatment plant accompanied with adequate laboratory control testing.

APPENDIX A

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Archie	500	Community	Avg. CCE (560 ppb) markedly exceeds recommended standard. Inadequate laboratory control.	No certified operator. No cross-connection program. Operator has limited experience.
Belton	10,000	Community		No certified operator. No cross-connection program.
Blue Springs	7,000	Community	Insufficient number of bacti. samples 12 months.	No certified operator. No cross-connection program.
Bonner Springs	3,600	Community	Insufficient frequency of bacti. sampling 12 months.	No certified operator. No cross-connection program. Old lines failing.
Buckner	1,850	Community	Insufficient frequency of bacti. sampling 2 months. Coliform density exceeds mandatory standards 1 month	No certified operator. No cross-connection program.
Clay County WD #2	2,600	Community	Insufficient frequency of bacti. sampling 2 months.	No certified operator. No cross-connection program.

NOTE: Each of the system's bacteriological record was evaluated on the basis of the Drinking Water Standards for this table. It should be noted the States' standards vary in some cases, based on system evaluation and judgment (See Appendix D).

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Clay County WD #3	750	Community	Avg. coliform density exceeds recommended standards 2 months.	No certified operator. No cross-connection program. No bacti. records kept.
Clay County WD #4	600	Community	Insufficient frequency of bacti. sampling 2 months.	No certified operator. No cross-connection program.
Clay County WD #5	450	Community	Exceeds recommended stds. for TDS, Fe, and Mn. Insufficient frequency of bacti. sampling 2 months. No chlorine residual in parts of distribution system. No cross-connection program.	No certified operator. Poor operation & maintenance.
Clay County WD #6	700	Community	Insufficient frequency of bacti. sampling 6 months.	No certified operator. No cross-connection program.
Cleveland	250	Community	Avg. CCE (203 ppb) exceeds recommended stds. Surface supply with operator not available due to full time job out of town. Inadequate laboratory control.	No certified operator. No cross-connection program. Operator has limited experience.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Creighton	280	Community	Avg. fluoride (3.0 mg/1) exceeds mandatory stds. TDS (2384.8 mg/1) markedly exceeds recommended stds. Chloride (1090 mg/1) markedly exceeds recommended stds. Boron (1.34 mg/1) exceeds recommended stds. Radium 226 (4.3 uuc/1) exceeds recommended stds. No chlorine residual in parts of distribution system. No cross-connection program.	No certified operator.
Dearborn	760	Community	Low pressure (<20 psi) in distribution system. No cross-connection program. Inadequate laboratory control.	No certified operator. No protection from chlorine gas.
DeSoto	2,100	Community	TDS (529.4 mg/1) exceeds recommended stds. Insufficient frequency of bacti. sampling for 3 months.	No cross-connection program.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Drexel	760	Community	Inadequate laboratory control	No cross-connection program.
East Lynne	245	Community	TDS (674.6 mg/l) exceeds recommended stds. Coliform density exceeds recommended stds. 2 months & mandatory stds. 1 month. No cross connection program. Private wells connected to system.	No certified operator.
Edgerton, Ks.	412	Community	No chlorine residual in parts of distribution system. No cross-connection control. Source quantity inadequate during dry periods & high demand.	No certified operator. Inadequate laboratory control.
Edgerton, Mo.	400	Community	Avg. Mn. (.078 mg/l) exceeds recommended stds.	No cross-connection program. No standby chemical feed.
Excelsior Springs	10,100	Community		No cross-connection program.
Freeman	525	Community	Inadequate laboratory control.	No certified operator. No cross-connection program.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Garden City	900	Community	Inadequate laboratory control	No certified operator. No cross-connection program. No records. Taste & odor problems.
Gardner	2,375	Community	Inadequate laboratory control	No certified operator. No cross-connection program.
Gladstone	25,000	Community	Max. Fe (1.295 mg/l) exceeds recommended stds.	Insufficient number of bacti. sampling 12 months based on reported pop. served. No chlorine residual in distribution system.
Grain Valley	750	Community	Inadequate laboratory control	Plant not well kept. No certified operator. No cross-connection program.
Harrisonville	5,000	Community		Need additional storage.
Jackson County Water Co.	335	Community	No operator	No cross-connection program.
Jackson County WD #1	15,000	Community	Insufficient number of bacti. sampling 12 months.	
Jackson County WD #2	19,200	Community	Insufficient number of bacti. sampling 12 months.	No certified operator. No cross-connection program.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Jackson County WD #8	2,600	Community	No bacti. records available Area of low (<20 psi) pressure.	No certified operator No cross-connection program.
Jackson County WD #12	1,000	Community	No bacti. records available No chlorine residual in parts of distribution system. No cross-connection program.	No certified operator.
Jackson County WD #13	1,600	Community	Insufficient frequency of bacti. sampling 2 months no samples.	No certified operator
J.C. Nichols Co.	12,000	Community		
Kansas City, Ks.	179,923	Community	Exceeds recommended stds. for TDS. Area of low (<20 psi) pressure.	
Kansas City, Mo.	650,000	Community	Area of low (<20 psi) pressure	
Kearney	1,000	Community	Coliform density exceeds recommended stds. 1 month	No certified operator. No cross-connection program.
Lake Annette	240	Special	Exceeds recommended stds. for TDS, Fe, and Mn. No bacti records available.by state or utility. Water not supposed to be used for drinking. No treatment. Source not adequately protected. Avg. coliform density (45/100 ml) at time of survey exceeds mandatory stds.	No certified operator. No cross-connection program. Reservoir not properly covered.

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SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Lake City Arsenal	7,000	Special		
Lake Tapawingo	1,200	Community	Insufficient frequency of bacti. sampling 3 months. Area of low (< 20 psi) pressure.	No certified operator. No cross-connection program. Operator has limited experience.
Lake Waukomis	1,150	Community	Insufficient frequency of bacti. sampling 4 months. Private systems pump from lake for lawn watering. No cross-connection program.	No certified operator.
Lake Winnebago	425	Community	No bacti records available.	No certified operator. No cross-connection program.
Lakeside Gardens Suvdiv.	85	Community	Insufficient frequency of bacti. sampling 6 months. Area of low (<20 psi) pressure.	No certified operator. No cross-connection program.
Lawson	1,200	Community	Inadequate laboratory control.	Less than one avg. day storage. No cross-connection program.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Lazy Acres Trailer Park	48	Special	No bacti. records available Truck used for hauling water in poor shape. Well is inadequate. Low pressure (<20 psi). Inadequate control of chlorination.	No certified operator No cross-connection program.
Lee's Summit	19,000	Community	Insufficient number of bacti. samples 12 months	No certified operator.
Lenexa	4,800	Community	No chlorine residual detected in distribution system.	No cross-connection program.
Liberty	14,000	Community		
Missouri Water Co.	116,000	Community		
Missouri Cities Water Co.	9,000	Community		No cross-connection program
Mosby	390	Community	Exceeds recommended stds. for Fe, Mn, and Cu. Coliform density exceeds mandatory stds. 2 months & recommended stds. 2 months. Poor operation. Area of low (<20 psi) pressure. Inadequate chlorination.	Chlorinator failures. No certified operator. No cross-connection program. Inadequate laboratory control
North Kansas City	6,000	Community		

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Oak Grove	2,000	Community	Source quality unknown. Plant overloaded. Inadequate laboratory control.	Bacti. samples not collected at representative points. No cross-connection program.
Olathe	15,000	Community	Insufficient number of bacti. samples 12 months.	
Olathe Naval Air Station	3,266	Special		No certified operator. Inadequate laboratory control.
Lake Olathe Trailer	50	Special	Insufficient frequency of bacti. sampling 2 months. No chlorine residual in distribution system. Well too close to lake.	No certified operator. No cross-connection program.
Olson's Oasis Well	70	Special	TDS (513 mg/l) exceeds recommended stds. Nitrates (50.5 mg/l) exceeds recommended stds. No bacti. records available. Avg. coliform density (265/100 ml) exceeds mandatory stds. at time of survey. No treatment.	No certified operator. No cross-connection program.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Peculiar	800	Community		No cross-connection program Inadequate laboratory control
Platte City	1,900	Community		Plant understaffed
Platte County WD #1	210	Community		No certified operator. No cross-connection program Inadequate laboratory control.
Platte County WD #2	500	Community	Exceeds recommended stds. for Fe and Mn.	No certified operator. No cross-connection program Inadequate laboratory control.
Platte County WD #3	520	Community	Insufficient frequency of bacti. sampling 3 months.	No certified operator. No cross-connection program
Platte County WD #4	904	Community		No certified operator. No cross-connection program Sand in lines.
Platte County WD #5	1,500	Community	Operator not available due to full time job out of town.	No certified operator. No cross-connection program Dirty water complaints.

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SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type Supply	Deficiency(ies)	Remarks
Platte County WD #6	800	Community		No certified operator. No cross-connection program
Pleasant Hill	3,700	Community		
Quickway Homes	1,750	Community	No bacti. records available. Exceeds recommended stds. for TDS.	No certified operator. No cross-connection program
Quivira, Inc.	1,000	Community	Insufficient number of bacti. sampling 5 months. Coliform density exceeds mandatory stds. 2 months. No chlorine residual in distribution system. No cross-connection program. Exceeds recommended stds. for TDS.	Reservoir not properly covered.
Raymore	400	Community	Avg. CCE (343 ppb) exceeds recommended stds. Inadequate laboratory control. Poor operation. No chlorine residual in distribution system. No cross-connection program.	No certified operator. No maintenance
Raytown	18,000	Community	Insufficient number of bacti. samples 12 months. No cross-connection program.	

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Richards-Gebaur AFB	10,000	Special	Insufficient frequency of bacti. sampling 6 months	No certified operator. No cross-connection program Has facilities to add fluorides, but samples showed less than recommended amount.
R W D #1, Johnson County	520	Community	No bacti. records available.	No certified operator. No cross-connection program
R W D #2, Johnson County	1,500	Community	Avg. GCE (247 ppb) exceeds recommended stds.	No cross-connection program Inadequate laboratory control.
R W D #3, Johnson County	1,200	Community	No bacti. records available	No certified operator No cross-connection program No chlorine residual in distribution system
R W D #4, Johnson County	540	Community	No bacti. records available	No certified operator No cross-connection program
*R W D #1, Wyandotte County	736	Community	Exceeds recommended stds. for turbidity, Fe, and Mn. Insufficient frequency of bacti. sampling 4 months. Poor maintenance. Area of low (<20 psi) pressure.	No certified operator. No cross-connection program Inadequate laboratory control.
R W D #2, Wyandotte County	400	Community	No bacti. records available	No certified operator No cross-connection program

*Well and treatment plant abandoned in September, 1969. Area now served by the Kansas City, Kansas supply.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
R W D #3, Wyandotte County	250	Community	No bacti. records available Exceeds recommended stds. for fluoride. Area of low (<20 psi) pressure.	No certified operator. No cross-connection program No chlorine residual in distribution system.
R W D #4, Wyandotte County	450	Community	No bacti. records available	No certified operator. No cross-connection program
R W D #7, Leavenworth	450	Community	No bacti. records available	No certified operator. No cross-connection program No chlorine residual in distribution system
Smithville	1,800	Community	Settling unit overloaded. Low pressures. No cross-connection program. Plant needs improvements.	No certified operator. Inadequate laboratory control. Plant subject to flooding. Inadequate storage.
Sugar Creek	4,000	Community	Area of low (<20 psi) pressure	No certified operator No cross-connection program
Sunflower Army Ammun. Plant	3,500	Special	TDS (509.7 mg/l) exceeds recommended stds.	No certified operator, but operator is well trained
*Spring Hill	1,080	Community	CCE (253 ppb) exceeds recommended stds. Poor maintenance. No chlorine residual in distribution system. No cross-connection program.	Inadequate laboratory control. Common wall. Reservoir inadequate

*Plant modified late in 1969 to improve flash mixing and sedimentation.

SUMMARY TABLE OF WATER SUPPLY SYSTEM EVALUATIONS (Contd.)

Name	Pop. Served	Type of Supply	Deficiency(ies)	Remarks
Tracy	240	Community	TDS (502.4 mg/l) exceeds recommended stds. Coliform density exceeds mandatory stds. 2 months.	No certified operator. No cross-connection program Well subject to flooding
Unity Village	137	Community	No bacti. records available. Inadequate laboratory control.	No certified operator. No cross-connection program Reservoir not properly covered.
W D #1 of Johnson County	160,000	Community		No cross-connection program
West Belton	1,165	Community		No certified operator. No cross-connection program
Weatherby Lake	756	Community	Insufficient frequency of bacti. sampling 3 months. Private wells connected to system. No cross-connection program.	No certified operator.
Weston	1,300	Community		No certified operator but operator has had training. No cross-connection program

APPENDIX B

WATER QUALITY DATA

OCC4 6191199010S0 BONNER SPG. CITY WATER SUPPLY CITY HALL BLDG BONNER SPRINGS, KANSAS 66012

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6191199010S0	3600	1	1	620	000	00	00	000	00	00	020	000	0	0	1	001	0	3 WELLS	000.27

AVERAGE

APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0CC1	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.04		.001	.000		1.27	.014	3.8	.006	65.	.141	0.09	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	01
	.00	.00	27.	.123	.000	.022	.010	.003	366.	0.	0.	0.0	

MAXIMUM

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
					1.30	.014	3.8	.006	65.	.381	0.09	9.	3

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	27.	.282	.000	.040	.020	.005	366.	L 5.	0.	0.0	

OCC4 6192486O0460 DESOTO WATER DEPT. CITY HALL DESOTO, KANSAS 66018

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6192486O0460	2100	1	1	200	003	01	00	000	01	10	004	010	0	0	0	001	0	2 WELLS	000.18

AVERAGE

APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0CC1	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.04		.003	.007		0.18	.028	0.2	.001	54.	.060	0.16	4.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	01
	.00	.13	21.	.138	.000	.047	.006	.004	529.	0.	0.	0.0	

MAXIMUM

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
		.004	.022		0.19	.032	0.2	.001	54.	.125	0.16	4.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	.13	21.	.285	.000	.081	.010	.004	529.	L 5.	0.	0.0	1

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, = LESS THAN OPTIMUM CONCENTRATION OF F.

84A

0004 619248650460 SUNFLOWER ARMY AMMUNITION DEPOT DESOTO, KANSAS 66019

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619248650460	3500	9	4	000	011	04	01	300	01	10	004	001	0	0	0	021	0	KANSAS RIVER, 13 WELLS	005.90

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.07		.004	.011	.157	0.27 ¤	.047	3.3	.007	73.	.052	0.19	10.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	
	.00	.12	24.	.028	.000	.023	.002	.005	510. *	0.	0.	0.0	01

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
						1							
.07		.006	.021	.157	0.27 ¤	.098 **	3.3	.007	73.	.066	0.19	10.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
									1			
	.00	.12	24.	.036	.000	.039	.005	.007	510. *	L 5.	0.	0.0

* *

0004 619268400460 EDGERTON CITY WATER SUPPLY CITY HALL BLDG EDGERTON, KANSAS 66021

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619268400460	412	4	1	002	013	00	01	000	00	01	004	001	0	0	0	001	0	RESERVOIR	000.03

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.05		.002	.006	.192	0.17 ¤	.025	3.1	.010	48.	.069	0.72	11.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	
	.00	.21	28.	.020	.000	.191	.006	.003	262.	0.	0.	0.5	00

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.05		.003	.020	.192	0.18 ¤	.031	3.1	.010	48.	.159	0.72	11.	2.0SR

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
						I						
	.00	.21	28.	.027	.000	.508 *	.011	.007	262.	L 5.	0.	1.0

* EXCEEDS RECOMMENDED STANDARDS. ** EXCEEDS MANDATORY STANDARDS. ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

00 05 A

0002 619306000460 J.C. NICHOLS CO. (FAIRWAY, KAN.)310 WARD PARKWAY KANSAS CITY, MISSOURI 64112

ID NC	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619306000460	12000	8	2	400	000	00	00	000	00	00	000	000	0	0	0	000	4	/KANSAS CITY/ 628421800420	001.32

AVERAGE

ABS 0001	BA 0000	CD 0002	CR 0002	CCE 0001	F 0002	PB 0002	NO3 0001	SE 0001	SO4 0001	ZN 0002	TURB 0001	BETA 0001	AVERAGE NO.
.04	.001	.011	.065	0.26 □	.008	3.5	.008	160.	.022	0.52	6.		

NC.	AS 0001	B 0001	CL 0001	CU 0002	CN 0001	FE 0002	MN 0002	AG 0002	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0001	
	.00	.00	18.	.048	.000	.036	.002	.003	351.	0.	0.	0.0	00

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.04	.001	.014	.065	0.29 □	.010	3.5	.008	160.	.033	0.52	6.		

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	18.	.053	.000	.048	.004	.005	351.	L 5.	0.	0.0

* *

0004 619337700460 GARDNER CITY WATER SUPPLY CITY HALL BLDG GARDNER, KANSAS 66030

ID NC	POP	T	C	IMP	COA	COP	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619337700460	2375	4	1	000	011	00	00	102	00	04	004	001	0	0	2	001	0	LAKE GARDNER	000.20

AVERAGE

ABS 0001	BA 0000	CD 0003	CR 0003	CCE 0001	F 0003	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0001	BETA 0001	AVERAGE NO.
.04	.003	.006	.174	0.96	.012	1.7	.009	32.	.025	0.73	7.		

NC.	AS 0001	B 0001	CL 0001	CU 0003	CN 0001	FE 0003	MN 0003	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	
	.00	.00	16.	.028	.000	.025	.007	.000	201.	0.	0.	0.0	00

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.04	.003	.018	.174	0.99	.015	1.7	.009	32.	.034	0.73	7.		

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	16.	.037	.000	.035	.016	.000	201.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB, AND COLOR IN STD. UNITS

0014 619457800460 WATER DISTRICT NO.1, JOHNSON CO.5916 DEARBORN SHAWNEE-MISSION, KANSAS 66202

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619457800460	160000	5	1	000	151	00	43	204	00	04	004	003	0	0	2	021	0	KANSAS RIVER, 21 WELLS	012.76

AVERAGE

	AS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0014	0014	0001	0014	0014	0001	0001	0001	0014	0001	0001	NO.
	.06		.001	.002	.114	0.96	.014	3.6	.008	65.	.023	0.90	0.	

NC.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
	0001	0001	0001	0014	0001	0014	0014	0014	0001	0001	0001	0013	
	.00	.00	29.	.027	.000	.016	.001	.002	294.	0.	0.	0.0	00

MAXIMUM

AS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.06		.003	.018	.114	1.10	.036	3.6	.008	65.	.106	0.90	0.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	29.	.058	.000	.133	.006	.005	294.	L 5.	0.	0.0

* *

0003 619457910460 RURAL WATER DIST, NO.1 - JOHNSONCOUNTY DESOTO, KANSAS 66019

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619457910460	520	8	1	200	000	00	00	000	00	00	000	000	0	0	0	000	4	/OLATHE/, RES., WELLS	000.03

AVERAGE

	AS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.06		.000	.006	.133	0.93	.017	3.4	.008	41.	.026	0.32	7.	

NC.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	
	.00	.00	18.	.022	.000	.021	.002	.003	260.	0.	2.	0.0	00

MAXIMUM

AS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.06		.002	.020	.133	1.08	.025	3.4	.008	41.	.043	0.32	7.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	18.	.027	.000	.026	.006	.007	260.	L 5.	2.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, D LESS THAN OPTIMUM CONCENTRATION OF F.

0704 619457920460 RURAL W.D. NO.2 - JOHNSON COUNTY STILLWELL, KANSAS 66085

ID NC	POP	T	C	IMP	COA	COP	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619457920460	1500	4	1	424	011	00	00	020	00	40	004	001	0	0	0	001	0	LITTLE BLUE CREEK	000.09

AVERAGE

ARS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	
				*	¤								
.06		.001	.012	.247	0.16	.018	1.6	.007	88.	.037	0.13	0.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	01
	.00	.00	23.	.028	.000	.044	.001	.002	329.	0.	0.	0.0	

MAXIMUM

MAXIMUM ARS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
				* 1	¤								
.06		.002	.022	.247	0.16	.025	1.6	.007	88.	.077	0.13	0.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	23.	.032	.000	.070	.003	.004	329.	L 5.	0.	0.0

* * * \

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0003 619457940460 RURAL W.D. NO.4 - JOHNSON COUNTYROUTE 2, BOX 60 OLATHE, KANSAS 66061

ID NC	POP	T	C	IMP	COA	CCR	TC	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619457940460	540	8	1	000	000	00	00	000	00	00	000	000	0	0	0	000	4	/OLATHE/ 619675400460	000.02

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.06		.001	.006	.133	1.08	.021	3.4	.008	41.	.024	0.32	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	DD
	.00	.00	18.	.014	.000	.012	.004	.002	260.	0.	2.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
		.002	.020	.133	1.20	.025	3.4	.008	41.	.036	0.32	7.	EXCD

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD													
	.00	L .100	18.	.019	.000	.026	.006	.007	260.	L 5.	2.	0.0	

* * * \

0005 619510400460 LENEXA MUNICIPAL WATER SUPPLY P.O. BOX 5293 LENEXA, KANSAS 66215

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619510400460	4800	8	1	424	000	00	00	000	00	00	000	000	0	0	0	000	4	/JOHNSON CWD NO 1/ 619437910460	000.66

	AVERAGE												AVERAGE
APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.06		.001	.004	.114	0.90	.021	3.6	.008	65.	.042	0.90	0.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0004
	.00	.00	29.	.027	.000	.012	.001	.001	294.	0.	0.	**02. 01 84.5

	MAXIMUM												MAXIMUM
APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
	.06		.002	.014	.114	0.96	.025	3.6	.008	65.	.090	0.90	0.

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	Z
EXCD												***	
	.00	L .100	29.	.032	.000	.013	.004	.003	294.	L 5.	0.	300.0	

0006 619675400460 OLATHE MUNICIPAL WATER WORKS CITY HALL OLATHE, KANSAS 66061

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619675400460	15000	5	1		051	00	00	200	02	40	004	001	0	0	3	021	0	RESERVOIR, 4 WELLS	001.44

	AVERAGE												AVERAGE
ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0002	0000	0004	0004	0001	0004	0004	0002	0002	0002	0004	0002	0002	NO.
.06		.000	.013	.133	1.03	.020	3.4	.006	58.	.025	0.25	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO.	0002	0002	0002	0004	0002	0004	0004	0004	0002	0002	0002	0003
	.00	.05	24.	.020	.000	.022	.006	.003	276.	0.	2.	**02. 01 73.7

	MAXIMUM												MAXIMUM
APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
	.06		.002	.021	.133	1.22	.025	3.5	.008	75.	.041	0.32	7.

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	Z
EXCD												***	
	.00	.11	30.	.023	.000	.026	.008	.007	293.	L 5.	3.	195.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.
*** COLIFORMS EXCEED 4/100 ML, RESAMPLING NECESSARY TO FIND CAUSE

90A

0003 619675440460 OLATHE NAVAL AIR STATION, USNAS OLATHE, KANSAS 66061

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619675440460	3266	9	4	100	011	00	01	132	10	01	004	001	0	0	0	001	0	LAKE GARDNER	000.29

AVERAGE

	APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.07		.000	.000		0.16 □	.010	1.4	.007	38.	.033	0.12	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0003	
	.00	.00	25.	.015	.000	.136	.006	.002	198.	0.	0.	** 10.0	01

MAXIMUM

	APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.07		.001	.000		0.17 □	.010	1.4	.007	38.	.041	0.12	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD												1	
	.00	.00	25.	.020	.000	.264	.014	.004	198.	L 5.	0.	*** 30.0	

* *

0002 619675450460 LAKE OLATHE TRAILER COURT ROUTE 3, BOX 184 OLATHE, KANSAS 66061

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619675450460	050	9	3		000	00	00	000	00	00	004	001	0	0	0	004	0	DUG WELL	

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0002	0002	0000	0002	0002	0001	0001	0001	0002	0001	0001	NO.
	.06		.001	.017		0.17 □	.026	1.0	.004	38.	.213	0.18	23.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0002	0001	0002	0002	0002	0001	0001	0001	0002	
	.00	.15	12.	.118	.000	.026	.017	.004	405.	0.	0.	0.0	00

MAXIMUM

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.06		.002	.020		0.18 □	.032	1.0	.004	38.	.241	0.18	23.	L 2.0SR

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	.15	12.	.177	.000	.041	.034	.005	405.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.
*** COLIFORMS EXCEED 4/100 ML, RESAMPLING NECESSARY TO FIND CAUSE

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0704 619753000460 QUIVIRA INC. (QUIVIRA LAKE) KANSAS CITY, KANSAS 66106

ID NC	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619753000460	1000	8	1	200	000	00	00	000	00	00	000	000	0	0	0	000	4	/KANSAS CITY/ 619465301050	000.10

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	NO.
0002	0000	0004	0004	0001	0003	0004	0002	0002	0002	0004	0002	0002	
.04		.000	.003	.113	0.94	.010	1.9	.006	87.	.019	0.50	4.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
	0002	0002	0002	0004	0002	0003	0003	0004	0002	0002	0002	0002	
NO.													00
	.00	.10	16.	.069	.000	.019	.003	.001	389.	0.	1.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.05		.002	.015	.113	0.96	.020	2.9	.008	155.	.047	0.87	6.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	.19	26.	.109	.000	.029	.007	.004	502.*	L 5.	2.	0.0

0704 619858000460 SPRING HILL WATER DEPT. SPRING HILL, KANSAS 66083

ID NC	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619858000460	1080	4	1	526	011	00	00	020	00	40	004	001	0	0	0	001	0	LITTLE BULL CREEK IMPOUNDMENT	000.09

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	NO.
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	
.09		.001	.003	.253*	0.11□	.020	1.7	.005	82.	1.508	0.25	5.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	
NO.													01
	.00	.00	17.	.052	.000	.104	.008	.003	340.	0.	2.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
				1									
.09		.002	.009	.253*	0.12□	.025	1.7	.005	82.	4.400	0.25	5.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	17.	.075	.000	.167	.014	.005	340.	L 5.	2.	0.0

* EXCEEDS RECOMMENDED STANDARDS. ** EXCEEDS MANDATORY STANDARDS. □ LESS THAN OPTIMUM CONCENTRATION OF F.

92

0004 619873450460 QUICK-WAY HOMES, WATER SUPPLY (SUNFLOWER VILLAGE) DE SOTO, KANSAS 66019

ID NO	POP	T	C	IMP	COA	COR	TC	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
619873450460	1750	8	2	300	000	00	00	000	00	00	000	000	0	0	0	000	4	/ARMY AMMO PLANT/	619248650460	000.10

AVERAGE

	APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
AVERAGE	.04		.004	.014	.157	0.24 □	.031	0.2	.001	54.	.033	0.16	4.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	01
AVERAGE	.00	.13	21.	.038	.000	.043	.004	.006	529. *	0.	0.	0.0	

MAXIMUM

	APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
							MAXIMUM							MAXIMUM EXCD
	.04		.004	.021	.157	0.28 □	.037	0.2	.001	54.	.040	0.16	4.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD									1				
	.00	.13	21.	.043	.000	.081	.010	.008	529. *	L 5.	0.	0.0	

* *

0004 619993711050 RURAL WATER DISTRICT NO.1 WYANDOTTE COUNTY, BETHEL BETHEL, KANSAS 66074

ID NO	POP	T	C	IMP	COA	COR	TC	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
619993711050	736	1	1	300	031	00	00	200	10	00	004	001	0	1	0	004	0	1 WELL	000.05

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
AVERAGE	.04		.001	.000		0.13 □	.021	0.7	.003	155.	.059	6.20 *	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	02
AVERAGE	.00	.73	45.	.033	.000	.696 *	.034	.002	499.	0.	0.	0.0	

MAXIMUM

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
							MAXIMUM					1		MAXIMUM EXCD
	.04		.002	.000		0.13 □	.026	0.7	.003	155.	.102	6.20 *	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD						1	1						
	.00	.73	45.	.041	.000	1.690 *	.075 *	.003	499.	L 5.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

93A

0002 619993721050 RURAL WATER DISTRICT NO.2, WYANDOTTE CO., RT.1 BASEHOR, KANSAS 66007

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
619993721050	400	8	1		000	00	00	000	00	00	000	000	0	0	0	000	0	/LEAVENWORTH/	619503800520	000.03

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0000	0000	0002	0002	0000	0002	0002	0000	0000	0000	0002	0000	0000	NO.
			.000	.000		0.30 □	.019				.019			

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0000	0000	0000	0002	0000	0002	0002	0002	0000	0000	0000	0002	00
				.036		.047	.003	.003				0.0	

MAXIMUM

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM EXCD			.001	.000		0.30 □	.025				.022			

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD				.041		.048	.003	.004				0.0

0003 619993731050 RURAL WATER DISTRICT NO.3 WYANDOTTE COUNTY, P.O. BOX 244 BONNER SPRINGS, KANSAS 66012

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
619993731050	250	8	1	430	000	00	00	000	00	00	000	000	0	0	0	000	4	/BONNER SPRINGS/	619119901050	000.00

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003 *	0003	0001	0001	0001	0003	0001	0001	NO.
	.04		.002	.000		1.27	.023	3.8	.006	65.	.775	0.09	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	01
	.00	.00	27.	.047	.000	.028	.008	.001	366.	0.	0.	0.0	

MAXIMUM

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM EXCD						3 *								
	.04		.004	.000		1.30	.031	3.8	.006	65.	2.240	0.09	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	27.	.060	.000	.050	.011	.005	366.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

0003 6199937410S0 RURAL WATER DISTRICT NO. 4, WYANDOTTE COUNTY (BONNER SPGS.) BONNER SPRINGS, KANSAS 66012

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
6199937410S0	450	8	1	430	000	00	00	000	00	00	000	000	0	0	0	000	4	/BONNER SPRINGS/	6191199010S0	000.03

AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.04		.002	.007		1.20	.025	3.8	.008	65.	.452	0.09	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002
	.00	.00	27.	.046	.000	.043	.028	.004	366.	0.	0.	00 0.0

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
					1 *								
.04		.004	.021		1.25	.037	3.8	.008	65.	.900	0.09	9.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
							1 *					
	.00	L .100	27.	.063	.000	.095	.066	.005	366.	L 5.	0.	0.0

* * * \

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0005 628022200190 ARCHIE MUNICIPAL WATER SUPPLY ARCHIE, MISSOURI 64725

ID NC	POP	T C IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628022200190	500	4 1	021	00	00	020	00	40	004	001	0	0	0	001	0	GRAND RIVER	000.03

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	NO.
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	
.05		.000	.007	* .560	¤ 0.18	.014	2.0	.007	52.	.861	0.23	6.	

NC.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	01
	.00	.00	19.	.020	.000	.034	.001	.001	244.	0.	0.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
				1									
.05		.001	.014	* .560	¤ 0.21	.019	2.0	.007	52.	2.332	0.23	6.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	.00	19.	.029	.000	.050	.002	.003	244.	L 5.	0.	0.0

* *

0004 628052800190 BELTON MUNICIPAL WATER SUPPLY BELTON, MISSOURI 64012

ID NO	POP	T C IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628052800190	10000	8 1	000	00	00	000	00	00	000	000	0	0	0	000	4	/KANSAS CITY/	628421800480	000.80

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	NO.
0002	0000	0004	0004	0001	0004	0004	0002	0002	0002	0004	0002	0002	
.04		.000	.002	.065	¤ 0.25	.013	3.2	.008	156.	.015	0.68	8.	

NC.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
	0002	0002	0002	0004	0002	0004	0004	0004	0002	0002	0002	0002	00
	.00	.07	17.	.039	.000	.041	.001	.001	349.	0.	0.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.04		.001	.009	.065	¤ 0.29	.0[illegible]4	3.5	.009	160.	.033	0.85	10.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	.14	18.	.043	.000	.064	.004	.003	351.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

96<

0003 628052850190 JACKSON COUNTY WATER CO, (DIKE'S ADDITION), P.O. BOX 183 BELTON, MISSOURI 64012

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628052850190	335	8	2	000	000	00	00	000	00	00	000	000	0	0	0	000	4	/PUB WSD NO 1/ 6194579 10460	000.02

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0002	0000	0003	0003	0001	0003 ¤	0003	0002	0002	0002	0003	0002	0002	NO.
.05		.001	.006	.133	0.52	.020	3.2	.008	109.	.012	0.23	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NC.	0002	0002	0002	0003	0002	0003	0003	0003	0002	0002	0002	0002 00
	.00	.10	22.	.029	.000	.024	.003	.003	301.	0.	1.	0.0

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
		.002	.020	.133	1.08	.025	3.4	.009	178.	.018	0.32	7.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	.20	26.	.039	.000	.031	.006	.007	341.	L 5.	2.	0.0

* *

0003 628052860190 LAKESIDE GARDENS SUBDIVISION, RT. 2, BOX 225A BELTON, MISSOURI 64012

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628052860190	085	8	2		000	00	00	000	00	00	004	001	0	0	0	000	4	/KANSAS CITY/ 6284218 00480	000.00

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0001	0000	0003	0003	0001	0003 ¤	0003	0001	0001	0001	0003	0001	0001	NO.
.04		.000	.003	.065	0.27	.012	3.5	.008	160.	.024	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002 00
	.00	.00	18.	.036	.000	.032	.001	.001	351.	0.	0.	0.0

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
		.001	.009	.065	0.29 ¤	.014	3.5	.008	160.	.033	0.52	6.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	18.	.043	.000	.048	.004	.003	351.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

0002 628052870190 LAZY ACRES TRAILER PARK BELTON, MISSOURI 64012

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628052870190	050	9	3		000	00	00	000	00	00	000	000	0	0	0	004	0	1 WELL	

	AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
	0000	0000	0002	0002	0000	0002	0002	0000	0000	0000	0002	0000	0000	
			.001	.010		0.25 □	.020				.645			

NO.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	0000	0000	0000	0002	0000	0002	0002	0002	0000	0000	0000	0002
				.050		.184	.011	.005				00 0.5

	MAXIMUM APS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
			.003	.020		0.25 □	.026				.784			

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
				.078		.242	.016	.005				1.0

* *

0003 628052880190 OLSON'S OASIS WELL TRAILER PARK RT. 2 BELTON, MISSOURI 64012

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628052880190	070	9	3		000	00	00	000	00	00	000	000	0	0	0	000	0	1 WELL	

	AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
	0001	0000	0003	0003	0000	0002	0003	0001	0001	0001	0003	0001	0001	
	.04		.000	.000		0.29 □	.009	51. *	.004	62.	.217	0.97	4.	

NO.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	0001	0001	0001	0003	0001	0002	0002	0003	0001	0001	0001	0002
	.00	.15	28.	.022	.000	.020	.004	.001	513. *	0.	0.	**02+ 03 235.0

	MAXIMUM APS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3 1	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.04		.001	.000		0.29 □	.020	51. *	.004	62.	.573	0.97	4.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS 1	COLOR	ALPHA	COLI 2
	.00	.15	28.	.027	.000	.022	.006	.003	513. *	L 5.	0.	*** 300.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.
*** COLIFORMS EXCEED 4/100 ML, RESAMPLING NECESSARY TO FIND CAUSE

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB, AND COLOR IN APHA UNITS

0003 628052890190 WEST BELTON SERVICE CO. P.O. BOX 349 BELTON, MISSOURI 64012

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628052890190	1165	8	2	200	000	00	00	000	00	00	000	000	0	0	0	000	4	/KANSAS CITY/	628421800480	000.06

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
					□								
.04		.000	.017	.065	0.26	.018	3.5	.008	160.	.018	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	18.	.028	.000	.030	.003	.002	351.	0.	0.	0.0	

MAXIMUM

MAXIMUM APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
					□								
.04		.001	.021	.065	0.29	.025	3.5	.008	160.	.033	0.52	6.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	18.	.043	.000	.048	.004	.004	351.	L 5.	0.	0.0

* *

0003 628075600480 BLUE SPRINGS WATER DEPT. 903 MAIN STREET BLUE SPRINGS, MISSOURI 64015

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628075600480	7000	8	1	000	000	00	00	000	00	00	000	000	0	0	0	000	4	/INDEPENDENCE/	628402600480	000.40

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0000	0001	NO.
					□								
.00		.000	.000		0.25	.008	0.0	.000	100.	.012		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0000	0001	0003	0001	0003	0003	0003	0001	0001	0001	0003	00
	.00		25.	.033	.000	.008	.000	.001	319.	3.	0.	0.0	

MAXIMUM

MAXIMUM AES	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
					□								
L .050		.002	.000		0.26	.014	L .4	L .002	100.	.015		6.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	L .010		25.	.055	L .004	.012	.001	.004	318.	3.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

99

0003 6281092004B0 BUCKNER MUNICIPAL WATER SUPT. BUCKNER, MISSOURI 64016

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
6281092004B0	1890	8	1	000	000	00	00	000	00	00	000	000	0	0	0	000	4	/INDEPENDENCE/	6284026004B0	000.15

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0000	0001	
.00		.001	.000		□ 0.26	.008	0.0	.000	100.	.134			6.

NC.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	0001	0000	0001	0003	0001	0003	0003	0003	0001	0001	0001	0003
00	.00		25.	.039	.000	.106	.008	.001	318.	3.	0.	0.0

MAXIMUM

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
L .050		.002	.000		□ 0.28	.014	L .4	L .002	100.	.379			6.

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	L .010		25.	.095	L .004	.298	.023	.004	318.	3.	0.	0.0

* *

0003 6281557002A0 CLAY COUNTY WATER DIST. NO. 2 LIBERTY, MISSOURI 64068

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
6281557002A0	2600	8	1	100	000	00	00	000	00	00	000	000	0	0	0	000	4	/KANSAS CITY/	6284218004B0	000.14

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	
.04		.001	.003	.065	□ 0.28	.012	3.5	.008	160.	.020	0.52	6.	

NC.	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002
00	.00	.00	18.	.041	.000	.033	.003	.000	351.	0.	0.	0.0

MAXIMUM

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.04		.001	.009	.065	□ 0.29	.016	3.5	.008	160.	.033	0.52	6.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	18.	.050	.000	.048	.004	.002	351.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

100

0004 6Z8155730240 CLAY COUNTY WATER DIST. NO. 3 HOLT, MISSOURI 64048

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6281557302 40	750	1	1	000	101	00	04	000	10	40	004	001	0	0	0	001	0	1 WELL	000.03

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0001	0000	0004	0004	0000	0003	0004	0001	0001	0001	0004	0001	0000	NO.
.06		.001	.000		0.26 ¤	.014	0.0	.002	12.	.023	0.07		

AVERAGE

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0004	0001	0003	0003	0004	0001	0001	0000	0002	00
	.00	.00	30.	.051	.000	.021	.002	.003	300.	0.		0.0	

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.06		.002	.000		0.28 ¤	.014	0.0	.002	12.	.032	0.07		

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	30.	.107	.000	.023	.004	.004	300.	L 5.		0.0

* * * \

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0004 628155750240 CLAY COUNTY WATER DIST. NO. 5 P.O. BOX 161 LIBERTY, MISSOURI 64068

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628155750240	450	1	1		500	00	00	000	00	00	020	060	0	0	0	001	0	1 WELL	000.03

AVERAGE

ABS 0001	BA 0000	CD 0003	CR 0003	CCE 0000	F 0003	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0001	BETA 0001	NO.
.04		.000	.000		¤ 0.25	.015	0.3	.003	91.	.057	1.20	0.	

AS NO. 0001	B 0001	CL 0001	CU 0003	CN 0001	FE 0003	MN 0003	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	
.00	.22	13.	.053	.000	* .426	.047	.000	* 549.	0.	0.	0.0	02

MAXIMUM

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.04		.001	.000		¤ 0.27	.017	0.3	.003	91.	.101	1.20	0.	

EXCD	AS	B	CL	CU	CN	FE 2	MN 1	AG	TDS 1	COLOR	ALPHA	COLI
L	.030	.22	13.	.085	.000	* .666	* .089	.000	* 549.	L 5.	0.	0.0

* *

0002 628155760240 CLAY COUNTY WATER DIST. NO. 6 BOX 227 KEARNEY, MISSOURI 64060

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628155760240	700	8	1		000	00	00	000	00	00	000	000	0	0	0	000	4	/KEARNEY/ 628422400240	000.04

AVERAGE

ABS 0001	BA 0000	CD 0002	CR 0002	CCE 0000	F 0002	PB 0002	NO3 0001	SE 0001	SO4 0001	ZN 0002	TURB 0001	BETA 0001	NO.
.04		.000	.000		¤ 0.26	.010	0.3	.003	38.	.022	0.07	0.	

AS NO. 0001	B 0001	CL 0001	CU 0002	CN 0001	FE 0002	MN 0002	AG 0002	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	
.00	.15	19.	.015	.000	.013	.000	.002	194.	0.	2.	0.0	00

MAXIMUM

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.04		.000	.000		¤ 0.27	.013	0.3	.003	38.	.027	0.07	0.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	.15	19.	.019	.000	.018	.001	.004	194.	L 5.	2.	0.0

* EXCEEDS RECOMMENDED STANDARDS. ** EXCEEDS MANDATORY STANDARDS. ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0P04 628158400190 CLEVELAND MUNICIPAL WATER SUPPLY CLEVELAND, MISSOURI 64734

ID NO	POP	T	O	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628158400190	250	4	1		011	00	00	020	00	40	004	001	0	0	0	004	0	LAKE	000.02

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA
AVERAGE	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001
	.07		.001	.000	* .203	□ 0.15	.012	8.0	.007	85.	.042	0.18	9.

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002
												01
AVERAGE	.00	.00	6.0	.036	.000	.036	.009	.000	260.	0.	0.	0.0

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA
MAXIMUM					1								MAXIMUM EXCD
	.07		.001	.000	* .203	□ 0.16	.013	8.0	.007	85.	.045	0.18	9.

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
MAXIMUM EXCD												
	.00	L .100	6.0	.042	.000	.071	.016	.000	260.	L 5.	0.	0.0

* *

0P06 628184200190 CREIGHTON MUNICIPAL WATER SUPPLY CREIGHTON, MISSOURI 64739

ID NO	POP	T	O	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628184200190	280	1	1	001	000	00	00	000	00	00	000	000	0	0	0	001	0	1 WELL	000.01

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA
AVERAGE	0001	0001	0003	0003	0000	0002	0003	0001	0001	0001	0003	0001	0001
	.05	.45	.001	.000		** 3.00	.017	0.0	.001	0.0	.137	0.20	12.

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO.	0001	0001	0001	0003	0001	0002	0002	0003	0001	0001	0001	0002
		*	*						*		*	05
AVERAGE	.00	1.34	1090.	.040	.000	.026	.003	.000	2385.	0.	6.	0.0

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA
MAXIMUM						2							MAXIMUM EXCD
	.05	.45	.002	.000		** 3.00	.025	L .1	.001	0.0	.192	0.20	12. L 2.0SR

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
MAXIMUM EXCD		1	1						1		1	
	.00	* 1.34	* 1090.	.063	.000	.031	.004	.000	* 2385.	L 5.	* 4.3RA	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0004 6281999800830 DEARBORN MUN. WATER SUPPLY DEARBORN, MISSOURI 64439

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6281999800830	760	4	1	430	011	00	00	020	00	40	004	001	0	0	0	001	0	IMPOUNDMENT	000.03

AVERAGE

ABS 0001	BA 0000	CD 0003	CR 0003	CCE 0001	F 0003	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0001	BETA 0001	AVERAGE NO.
.04		.001	.015	.104	0.23 □	.025	1.4	.007	47.	.017	0.38	0.	

	AS 0001	B 0001	CL 0001	CU 0003	CN 0001	FE 0003	MN 0003	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	
NO.	.00	.20	11.	.012	.000	.016	.000	.003	232.	0.	0.	** 1.5	01

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.04		.002	.019	.104	0.28 □	.030	1.4	.007	47.	.025	0.38	0.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD	.00	.20	11.	.017	.000	.022	.001	.004	232.	L 5.	0.	3.0	1

* *

0003 6282214001900 DREXEL MUNICIPAL WATER SUPPLY DREXEL, MISSOURI 64742

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6282214001900	760	4	1		011	00	00	020	10	01	004	001	0	0	0	001	0	2 IMPOUNDMENTS	000.06

AVERAGE

ABS 0001	BA 0000	CD 0003	CR 0003	CCE 0001	F 0003	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0001	BETA 0001	AVERAGE NO.
.08		.000	.000	.141	0.15 □	.012	23.	.007	64.	.022	1.40	11.	

	AS 0001	B 0001	CL 0001	CU 0003	CN 0001	FE 0003	MN 0003	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	
NO.	.00	.00	21.	.021	.000	.016	.001	.002	286.	0.	0.	0.0	00

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.08		.001	.000	.141	0.20 □	.016	23.	.007	64.	.028	1.40	11.	L 2.0SR

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD	.00	.00	21.	.025	.000	.027	.002	.003	286.	L 5.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

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0F04   628229800190     EAST LYNNE MUNICIPAL WATER SUP. CITY BLDG.                    EAST LYNNE, MISSOURI        64743
  ID NO            POP  T C IMP    COA COR TO MIX AER SED FIT FIM AM RC FL DIS CL      SOURCE  OF  SUPPLY             AV DAY
628229800190       245 1 1 200     000  00 00 000  00  00 000 000  0  0  0 001  0  1 WELL                              000.01
AVERAGE                                         AVERAGE                                                               AVERAGE
 ABS     BA       CD       CR       CCE      F        PB       NO3      SE       SO4      ZN       TURB     BETA
0001     0001     0003     0003     0000     0003     0003     0001     0001     0001     0003     0001     0001      NO.

 .05     .35      .002     .010              0.98     .018     0.2      .002     0.0      .079     0.43     2.

  AS       B        CL       CU       CN       FE       MN                        AG       TDS      COLOR    ALPHA    COLI
NC. 0001  0001     0001     0003     0001     0003     0003                      0003     0001     0001     0001     0002
                                                                                           *                                  01
  .00      .99      28.      .039     .000     .050     .001                      .001     675.     0.       0.       0.0

MAXIMUM                                        MAXIMUM                                                                MAXIMUM
 ABS     BA       CD       CR       CCE      F        PB       NO3      SE       SO4      ZN       TURB     BETA
                                                                                                                         EXCD

 .05     .35      .003     .016              0.99     .026     0.2      .002     0.0      .199     0.43     2.

  AS       B        CL       CU       CN       FE       MN                        AG       TDS      COLOR    ALPHA    COLI
EXCD                                                                                        1
                                                                                           *
  .00      .99      28.      .045     .000     .067     .003                      .003     675.     L 5.     0.       0.0

*  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
0003   628232200830     EDGERTON MUN. WATER SUPPLY                                    EDGERTON, MISSOURI          64444
  ID NO            POP  T C IMP    COA COR TO MIX AER SED FIT FIM AM RC FL DIS CL      SOURCE  OF  SUPPLY             AV DAY
628232200830       400 1 1         111  00 00 120  00  40 020 001  0  0  0 001  0  1 WELL                              000.01
AVERAGE                                         AVERAGE                                                               AVERAGE
 ABS     BA       CD       CR       CCE      F        PB       NO3      SE       SO4      ZN       TURB     BETA
0001     0000     0003     0003     0000     0003     0003     0001     0001     0001     0003     0001     0001      NO.
                                             □
 .04              .000     .006              0.00     .023     0.2      .002     34.      .081     0.14     0.

  AS       B        CL       CU       CN       FE       MN                        AG       TDS      COLOR    ALPHA    COLI
NC. 0001  0001     0001     0003     0001     0003     0003                      0003     0001     0001     0001     0002
                                                        *                                                                     01
  .00      .00      29.      .035     .000     .060     .078                      .001     241.     0.       0.       0.0

MAXIMUM                                        MAXIMUM                                                                MAXIMUM
 ABS     BA       CD       CR       CCE      F        PB       NO3      SE       SO4      ZN       TURB     BETA
                                                                                                                         EXCD
                                             □
 .04              .001     .020              L0.10    .025     0.2      .002     34.      .194     0.14     0.

  AS       B        CL       CU       CN       FE       MN                        AG       TDS      COLOR    ALPHA    COLI
EXCD                                                     1
                                                        *
 L .030    .00      29.      .064     .000     .112     .171                      .004     241.     L 5.     0.       0.0
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* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

105A

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L. COLIFORMS PER 100/ML. TURB. AND COLOR IN STD. UNITS

0004 628258000240 EXCELSOIR SPRINGS WATER SUPPLY EXCELSOIR SPRINGS,MISSOURI 64024

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628258000240	10100	1	1	361	010	00	00	100	10	14	004	001	0	1	0	001	0	3 WELLS	000.90

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
AVERAGE	.07		.000	.005		0.18 □	.012	0.5	.003	31.	.014	0.13	0.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.16	7.7	.058	.000	.036	.001	.001	188.	0.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM							MAXIMUM							MAXIMUM
EXCD			.000	.008		0.18 □	.016	0.5	.003	31.	.018	0.13	0.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	.16	7.7	.068	.000	.044	.002	.002	188.	L 5.	0.	0.0

* *

0005 628289800190 FREEMAN MUNICIPAL WATER SUPPLY FREEMAN, MISSOURI 64746

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628289800190	525	4	1		011	00	00	020	00	40	004	001	0	0	0	001	0	LAKE	000.03

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
AVERAGE	.05		.001	.002	.197	0.15 □	.016	4.8	.007	54.	.032	0.30	4.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	17.	.022	.000	.014	.002	.001	247.	0.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM							MAXIMUM							MAXIMUM
EXCD			.002	.008	.197	0.18 □	.025	4.8	.007	54.	.070	0.30	4.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	17.	.031	.000	.025	.003	.003	247.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS. ** EXCEEDS MANDATORY STANDARDS. □ LESS THAN OPTIMUM CONCENTRATION OF F.

0004 6282808850190 LAKE ANNETTE WATER SUPPLY ROUTE 1 FREEMAN, MISSOURI 64746

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6282808850190	240	1	2		000	00	00	000	00	00	000	000	0	0	0	000	0	3 WELLS	

AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
0002	0000	0004	0004	0000	0002	0004	0002	0002	0002	0004	0002	0002	
					¤								
.05		.003	.010		0.30	.021	22.	.011	90.	.202	0.29	2.	

NO.	AS 0002	B 0002	CL 0002	CU 0004	CN 0002	FE 0002	MN 0002	AG 0004	TDS 0002	COLOR 0002	ALPHA 0002	COLI 0002	
	.00	.07	46.	.024	.000	.748 *	.531 *	.004	684. *	0.	2.	3.0 **	04

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
					¤			** 1					
.06		.008	.024		0.39	.032	41.	.018	116.	.538	0.32	3.	

EXCD	AS	B	CL	CU	CN	FE 1	MN 2	AG	TDS 2	COLOR	ALPHA	COLI 1	
	.00	.13	60.	.034	.000	1.434 *	.671 *	.006	734. *	L 5.	0.2RA	6.0 ***	

* *

0004 6282808200190 GARDEN CITY MUNICIPAL WATER SUPPLY GARDEN CITY, MISSOURI 64747

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6282808200190	900	4	1	000	011	00	00	020	00	40	004	001	0	0	0	001	0	IMPOUNDMENT	000.06

AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
0001	0000	0004	0004	0000	0003	0004	0001	0001	0001	0004	0001	0001	
					¤								
.07		.000	.002		0.14	.018	5.0	.009	38.	.023	0.87	7.	

NO.	AS 0001	B 0001	CL 0001	CU 0004	CN 0001	FE 0003	MN 0003	AG 0004	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	
	.00	.00	14.	.024	.000	.037	.007	.000	194.	0.	0.	0.0	00

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
					¤								
.07		.001	.008		0.15	.044	5.0	.009	38.	.059	0.87	7.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
	.00	L .100	14.	.037	.000	.048	.012	.002	194.	L 5.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, ¤ LESS THAN OPTIMUM CONCENTRATION OF F.
*** COLIFORMS EXCEED 4/100 ML. RESAMPLING NECESSARY TO FIND CAUSE

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0005 6283081002 40 GLADSTONE MUNICIPAL WATER SUPPLY BOX 10688 GLADSTONE, MISSOURI 64118

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628308100240	25000	1	1	420	013	00	00	000	10	20	004	010	0	1	0	001	0	3 WELLS	001.40

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0004	0004	0000	0004	0004	0001	0001	0001	0004	0001	0001	NO.
						□ 0.19	.014	0.8	.005	92.	.017	0.20	5.	
	.06		.000	.000										

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0004	0001	0004	0004	0004	0001	0001	0001	0003	01
						*							
	.00	.11	23.	.062	.000	.432	.008	.000	251.	0.	0.	0.0	

MAXIMUM

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM														EXCD
						□ 0.20	.016	0.8	.005	92.	.028	0.20	5.	
	.06		.000	.000										

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD						* 1							
	.00	.11	23.	.077	.000	1.295	.013	.002	251.	L 5.	0.	0.0	

* *

0003 6283210004 80 GRAIN VALLEY CITY WATER SUPPLY CITY HALL BUILDING GRAIN VALLEY, MISSOURI 64029

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628321800480	750	4	1	100	011	00	00	120	00	44	004	001	0	0	0	001	0	SNI-A-BAR CREEK	000.03

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0000	0000	0002	0002	0000	0002	0002	0000	0000	0000	0002	0000	0000	NO.
			.000	.019		□ 0.24	.024				.145			

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0000	0000	0000	0002	0000	0002	0002	0002	0000	0000	0000	0002	00
				.074		.093	.008	.004				0.0	

MAXIMUM

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM														EXCD
			.000	.019		□ 0.25	.030				.245			

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD													
				.119		.165	.010	.004				0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

106K

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0005 628351600190 HARRISONVILLE WATER SUPPLY HARRISONVILLE, MISSOURI 64701

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6283516 00190	5000	4	1	122	011	00	00	100	02	02	004	001	0	0	0	001	0	2 IMPOUNDMENTS	000.45

	AVERAGE APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.05		.001	.009	.104	0.17 □	.018	5.0	.005	63.	.018	1.10	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	16.	.018	.000	.020	.003	.002	261.	0.	0.	0.0	

	MAXIMUM APS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.05		.003	.014	.104	0.18 □	.025	5.0	.005	63.	.024	1.10	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	16.	.027	.000	.026	.004	.003	261.	L 5.	0.	0.0	

* *

0013 628402600480 MISSOURI WATER CO. 11610 TRUMAN BLVD. INDEPENDENCE, MISSOURI 64050

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6284026 00480	116000	1	2	020	010	00	00	020	10	04	004	001	0	0	0	001	0	12 WELLS	012.75

	AVERAGE APS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0013	0013	0000	0013	0013	0001	0001	0001	0013	0000	0001	NO.
	.00		.000	.004		0.26 □	.014	0.0	.000	100.	.010		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0000	0001	0013	0001	0013	0013	0013	0001	0001	0001	0013	00
	.00		25.	.020	.000	.009	.000	.000	318.	3.	0.	0.0	

	MAXIMUM APS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	L .050		.002	.014		0.28 □	.030	L .4	L .002	100.	.028		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	L .010		25.	.055	L .004	.013	.001	.004	318.	3.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

0003 628410700480 JACKSON COUNTY WATER DIST. NO.1 GRANDVIEW, MISSOURI 64030

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628410700480	19000	8	1	200	000	00	00	000	00	00	000	000	0	0	0	000	4	/KANSAS CITY/	628421800480	001.00

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	AVERAGE NO.
	.04		.001	.019	.065	0.28 □	.014	3.5	.008	160.	.016	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	18.	.028	.000	.027	.001	.003	351.	0.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM EXCD						MAXIMUM								MAXIMUM
	.04		.001	.029	.065	0.29 □	.020	3.5	.008	160.	.033	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	18.	.043	.000	.048	.004	.004	351.	L 3.	0.	0.0

* *

0003 628410710480 JACKSON COUNTY WATER DIST. NO.2 6945 BLUE RIDGE RAYTOWN, MISSOURI 64130

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628410710480	19200	8	1		000	00	00	000	00	00	000	000	0	0	0	000	4	/INDEPENDENCE/	628402800480	001.27

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0000	0001	AVERAGE NO.
	.00		.000	.012		0.26 □	.017	0.0	.000	100.	.008		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0000	0001	0003	0001	0003	0003	0003	0001	0001	0001	0003	00
	.00		25.	.032	.000	.011	.000	.002	318.	3.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM EXCD						MAXIMUM								MAXIMUM
	L .030		.002	.037		0.28 □	.019	L .4	L .002	100.	.010		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	L .010		25.	.055	L .004	.023	.001	.004	318.	3.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS. ** EXCEEDS MANDATORY STANDARDS. □ LESS THAN OPTIMUM CONCENTRATION OF F.

140A

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0003 628410720480 JACKSON COUNTY WATER DIST. NO. 8 P.O. BOX 216 BLUE SPRINGS, MISSOURI 64015

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628410720480	2600	8	1	100	000	00	00	000	00	00	000	000	0	0	0	000	4	/INDEPENDENCE/	628402600480	000.30

AVERAGE

ABS 0001	BA 0000	CD 0003	CR 0003	CCE 0000	F 0003	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0000	BETA 0001	NO.
.00		.001	.000		0.26 □	.011	0.0	.000	100.	.015		6.	

	AS 0001	B 0000	CL 0001	CU 0003	CN 0001	FE 0003	MN 0003	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0003	
NO.													00
	.00		25.	.029	.000	.095	.000	.002	318.	3.	0.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
L .050		.002	.000		0.28 □	.014	L .4	L .002	100.	.019		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	L .010		25.	.055	L .004	.270	.001	.004	318.	3.	0.	0.0	

* *

0003 628410730480 JACKSON COUNTY WATER DIST. NO.12 GREENWOOD, MISSOURI 64034

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628410730480	1000	8	1		000	00	00	000	00	00	000	000	0	0	0	000	4	/JACKSON CNTY WD NO 14/	000.05

AVERAGE

ABS 0001	BA 0000	CD 0003	CR 0003	CCE 0001	F 0003	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0001	BETA 0001	NO.
.03		.000	.013	.192	0.25 □	.015	0.4	.006	48.	.037	1.10	9.	

	AS 0001	B 0001	CL 0001	CU 0003	CN 0001	FE 0003	MN 0003	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	
NO.													00
	.00	.11	18.	.031	.000	.032	.001	.002	219.	0.	0.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.03		.001	.020	.192	0.25 □	.019	0.4	.006	48.	.057	1.10	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	.11	18.	.045	.000	.063	.002	.004	219.	L 5.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0004 628410740480 JACKSON COUNTY WATER DIST. NO.13RT.4, BOX 518 LEE'S SUMMIT, MISSOURI 64063

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628410740480	1600	8	1		000	00	00	000	00	00	000	000	0	0	0	000	4	/LEES SUMMIT/	628459600480	000.03

	AVERAGE												AVERAGE
ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0002	0000	0004	0004	0001	0004	0004	0002	0002	0002	0004	0001	0002	NO.
.02		.001	.007	.065	0.26 □	.012	1.7	.004	130.	.404	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0002	0001	0002	0004	0002	0004	0004	0004	0002	0002	0002	0003	00
	.00	.00	22.	.047	.000	.035	.001	.003	334.	1.	0.	0.0	

MAXIMUM						MAXIMUM						MAXIMUM
ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.04		.002	.020	.065	0.29 □	.019	3.5	.008	160.	1.560	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	25.	.078	.000	.070	.004	.004	351.	3.	0.	0.0	

* *

0035 628421800480 KANSAS CITY MUNICIPAL WATER SUPPLY, 414 E. 12TH STREET KANSAS CITY, MISSOURI 64106

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628421800480	650000	4	1	020	013	01	05	044	00	44	004	001	0	1	0	010	0	MISSOURI RIVER	097.94

	AVERAGE												AVERAGE
ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
0001	0000	0029	0029	0001	0028	0029	0001	0001	0081	0029	0001	0001	NO.
.04		.002	.005	.065	0.24 □	.011	3.5	.008	160.	.013	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0029	0001	0029	0029	0029	0001	0001	0001	0028	00
	.00	.00	18.	.055	.000	.068	.002	.001	351.	0.	0.	0.0	

MAXIMUM						MAXIMUM						MAXIMUM
ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.04		.006	.019	.065	0.29 □	.020	3.5	.008	160.	.033	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	18.	.208	.000	.536 * 1	.013	.005	351.	L 5.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS. ** EXCEEDS MANDATORY STANDARDS. □ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0004 628422400240 KEARNEY MUNICIPAL WATER SUPPLY CITY HALL BLDG. KEARNEY, MO. 64060

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628422400240	1000	1	1		011	00	00	020	10	04	004	001	0	0	0	001	0	2 WELLS	000.15

	AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.06		.000	.000		0.26 □	.018	0.4	.002	40.	.020	0.08	3.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	16.	.015	.000	.011	.003	.001	188.	0.	0.	0.0	

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.06		.000	.000		0.27 □	.030	0.4	.002	40.	.022	0.08	3.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	16.	.017	.000	.018	.009	.004	188.	L 5.	0.	0.0	

* *

0003 628442850480 LAKE CITY ARMY AMMUNITION PLANT WATER SUPPLY INDEPENDENCE, MISSOURI 64050

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628442850480	7000	9	4	100	041	01	00	020	10	40	004	001	0	0	0	001	0	11 WELLS	002.80

	AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0003	0003	0000	0002	0003	0001	0001	0001	0003	0001	0001	NO.
	.04		.000	.002		0.15 □	.012	0.0	.002	46.	.062	0.25	11.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0002	0002	0003	0001	0001	0001	0002	00
	.00	.00	16.	.024	.000	.165	.034	.002	182.	0.	3.	0.0	

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.04		.001	.007		0.15 □	.016	0.0	.002	46.	.144	0.25	11.	2.0SR

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	16.	.046	.000	.182	.041	.002	182.	L 5.	3.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0003 628444700480 LAKE TAPAWINGO WATER SUPPLY 185-A BLUE SPRINGS, MISSOURI 64015

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628444700480	1200	8	2	100	000	00	00	000	00	00	000	000	0	0	0	000	4	/INDENPENDENCE/	628402600480	000.05 AVERAGE

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	NO.
0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0000	0001	
					¤								
.00		.001	.000		0.23	.011	0.0	.000	100.	.018		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0000	0001	0003	0001	0003	0003	0003	0001	0001	0001	0003	00
	.00		25.	.036	.000	.013	.000	.002	318.	3.	0.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
					¤								
L .050		.002	.000		0.25	.014	L .4	L .002	100.	.025		6.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	L .010		25.	.055	L .004	.019	.001	.004	318.	3.	0.	0.0

* *

0002 628445000830 LAKE WAUKOMIS WATER SYSTEM 1147 SHORE DRIVE PARKVILLE, MISSOURI 64152

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628445000830	1150	8	1		000	00	00	000	00	00	000	000	0	0	0	000	4	/PARKVILLE/	628614450830	000.05 AVERAGE

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	NO.
0000	0000	0002	0002	0000	0002	0002	0000	0000	0000	0002	0000	0000	
		.002	.000		¤ 0.22	.025				.020			

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0000	0000	0000	0002	0000	0002	0002	0002	0000	0000	0000	0002	00
				.099		.068	.004	.004				0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
		.002	.000		¤ 0.23	.025				.026			

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
				.143		.072	.004	.004				0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

0004 628445500480 LAKE WINNEBAGO WATER SUPPLY GREENWOOD, MISSOURI 64034

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628445500480	425	8	2		000	00	00	000	00	00	000	000	0	0	0	000	4	/LEES SUMMIT/ 628459600480	000.04

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0002	0000	0004	0004	0001	0004 □	0004	0002	0002	0002	0004	0001	0002	AVERAGE NO.
	.02		.001	.002	.065	0.25	.006	1.7	.004	130.	.016	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0002	0001	0002	0004	0002	0004	0004	0004	0002	0002	0002	0003	00
	.00	.00	22.	.043	.000	.020	.002	.002	334.	1.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM						□								MAXIMUM EXCD
	.04		.002	.009	.065	0.29	.014	3.5	.008	160.	.033	0.52	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
EXCD													
	.00	L .100	25.	.055	.000	.048	.004	.004	351.	3.	0.	0.0	

* *

0005 628455400240 LAWSON MUNICIPAL WATER SUPPLY LAWSON, MISSOURI 64062

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628455400240	1200	4	1	000	011	00	00	020	00	40	004	001	0	0	0	001	0	RESERVOIR	000.08

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003 □	0003	0001	0001	0001	0003	0001 *	0000	AVERAGE NO.
	.03		.001	.000		0.20	.015	0.8	.004	58.	.014	1.50		

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0000	0002 **	02
	.00	.00	12.	.034	.005	.201	.010	.003	252.	0.		2.5	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM						□						1 *		MAXIMUM EXCD
	.03		.002	.000		0.22	.019	0.8	.004	58.	.018	1.50		

	AS	B	CL	CU	CN	FE 1	MN	AG	TDS	COLOR	ALPHA	COLI 1	
EXCD						*						***	
	.00	L .100	12.	.070	.005	.467	.021	.007	252.	L 5.		5.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.
*** COLIFORMS EXCEED 4/100 ML, RESAMPLING NECESSARY TO FIND CAUSE

0P04 628459600480 LEE'S SUMMIT MUNICIPAL WATER SUPPLY LEE'S SUMMIT, MISSOURI 64063

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628459600480	19000	8	1	001	000	00	00	000	00	00	000	000	0	0	0	000	4	/INDEPENDENCE + KANSAS CITY/	002.70

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0002	0000	0004	0004	0000	0004	0004	0002	0002	0002	0004	0000	0002	NO.
	.00		.001	.005		0.25 □	.010	0.0	.000	100.	.011		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0002	0000	0002	0004	0002	0004	0004	0004	0002	0002	0002	0004	
	.00		25.	.056	.000	.008	.001	.003	318.	3.	0.	125.0 **	01

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	L .050		.002	.020		0.28 □	.014	L .4	L .002	100.	.015		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	L .010		25.	.076	L .004	.015	.003	.004	318.	3.	0.	500.0 ***	1

* *

0P04 628468600240 LIBERTY MUNICIPAL WATER SUPPLY LIBERTY, MISSOURI 64068

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628468600240	14000	1	1		000	00	00	200	10	00	004	001	0	0	2	001	0	3 WELLS	001.08

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.04		.000	.000		0.84	.010	0.1	.002	36.	.015	0.20	3.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	
	.00	.00	33.	.009	.000	.006	.000	.000	164.	0.	0.	0.0	00

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.04		.000	.000		0.87	.010	0.1	.002	36.	.017	0.20	3.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	33.	.017	.000	.008	.001	.000	164.	L 5.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.
*** COLIFORMS EXCEED 4/100 ML, RESAMPLING NECESSARY TO FIND CAUSE

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0003 628555000240 MOSBY MUNICIPAL WATER SUPPLY CITY HALL BLDG. MOSBY, MO. 64073

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628555000240	390	1	1		010	00	00	000	01	40	020	001	0	0	0	001	0	1 WELL	000.01

AVERAGE

ABS 0001	BA 0001	CD 0003	CR 0003	CCE 0000	F 0003	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0001	BETA 0001	NO.
.05	.00	.002	.014		0.28 ¤	.037	1.7	.004	0.0	.048	0.46	0.	

NC.	AS 0001	B 0001	CL 0001	CU 0003	CN 0001	FE 0003	MN 0003	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0003	01
	.00	.14	18.	.607	.000	.306	1.175 *	.002	380.	0.	0.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.05	L .200	.005	.022		0.29 ¤	.079 **	1.7	.004	0.0	.074	0.46	0.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	.14	18.	1.720 *	.000	.645 *	1.330 *	.004	380.	L 5.	0.	0.0

* *

0003 628587200240 NORTH KANSAS CITY WATER SUPPLY CITY HALL BLDG. NORTH KANSAS CITY, MO. 64141

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628587200240	6000	1	1		110	01	00	000	01	00	004	001	0	0	0	001	0	5 WELLS	003.33

AVERAGE

ABS 0001	BA 0000	CD 0003	CR 0003	CCE 0000	F 0002	PB 0003	NO3 0001	SE 0001	SO4 0001	ZN 0003	TURB 0001	BETA 0001	NO.
.06	.001	.006			0.33 ¤	.010	0.7	.002	182.	.018	1.40	7.	

NC.	AS 0001	B 0001	CL 0001	CU 0003	CN 0001	FE 0002	MN 0002	AG 0003	TDS 0001	COLOR 0001	ALPHA 0001	COLI 0002	01
	.00	.00	26.	.026	.000	.010	.003	.001	550. *	0.	4.	0.0	

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	EXCD
.06		.001	.010		0.33 ¤	.011	0.7	.002	182.	.020	1.40	7.	

EXCD	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
	.00	L .100	26.	.035	.000	.012	.003	.002	550. *	L 5.	4. *	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0005 6285g1600480 OAK GROVE MUNICIPAL WATER SUPPLY OAK GROVE, MISSOURI 64075

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6285g1600480	2000	4	1	020	011	00	00	002	00	40	004	001	0	0	0	001	0	SNI-A-BAR CREEK	000.10

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	AVERAGE NO.
	.05		.000	.006	.121	0.21 □	.019	0.2	.001	49.	.015	0.67	5.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.11	21.	.015	.000	.022	.004	.001	249.	0.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM								MAXIMUM						MAXIMUM EXCD
	.05		.001	.020	.121	0.22 □	.025	0.2	.001	49.	.017	0.67	5.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	.11	21.	.019	.000	.032	.004	.004	249.	L 5.	0.	0.0

* *

0704 628614450830 MISSOURI CITIES WATER CO. PARKVILLE, MISSOURI 64152

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628614450830	9000	1	2		000	00	00	200	00	10	004	001	0	0	0	001	0	4 WELLS	000.96

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	AVERAGE NO.
	.04		.002	.007		0.21 □	.017	0.1	.004	114.	.023	0.47	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	29.	.079	.000	.171	.013	.002	403.	0.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM								MAXIMUM						MAXIMUM EXCD
	.04		.004	.021		0.22 □	.022	0.1	.004	114.	.033	0.47	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	29.	.108	.000	.271	.024	.004	403.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

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0003 6286216001900 PECULIAR MUNICIPAL WATER SUPPLY PECULIAR, MISSOURI 64078

ID NO	POP	T	O	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6286216001900	800	4	1		011	00	00	020	00	40	004	001	0	0	0	001	0	IMPOUNDMENT	000.06

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	AVERAGE NO.
	.05		.001	.000		0.17 ¤	.012	3.8	.006	66.	.019	0.84	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	
	.00	.12	17.	.018	.000	.229	.008	.002	259.	0.	0.	0.0	00

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM EXCD							MAXIMUM							MAXIMUM
	.05		.002	.000		0.20 ¤	.013	3.8	.006	66.	.036	0.84	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD						1						
	L .030	.12	17.	.027	.000	.629 *	.016	.005	259.	L 5.	0.	0.0

* * * \

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB. AND COLOR IN STD. UNITS

0704 628636040830 PLATTE COUNTY WATER DIST. NO.1 FARLEY, MISSOURI 64028

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628636040830	210	1	2	000	020	00	00	001	10	40	020	001	0	0	0	004	0	1 WELL	000.00

	AS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.07		.001	.029		0.37 ¤	.024	0.2	.002	45.	.033	0.67	0.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.16	13.	.067	.000	.182	.010	.005	474.	0.	0.	0.0	

	AS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM							MAXIMUM							MAXIMUM
ABS														EXCD
	.07		.002	.041		0.37 ¤	.032	0.2	.002	45.	.041	0.67	0.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD						1						
	.00	.16	13.	.112	.000	.515 *	.030	.007	474.	L 5.	0.	0.0

* * * \

0704 628636060830 PLATTE COUNTY WATER DIST. NO. 3 WESTON, MISSOURI 64098

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628636060830	920	8	1	000	000	00	00	000	00	00	000	000	0	0	0	000	4	/WESTON/ 6288?1800830	000.01

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0002	0000	0004	0004	0000	0004	0004	0002	0002	0002	0004	0002	0002	NO.
.06		.001	.009		0.15 □	.015	0.0	.003	77.	.016	0.30	6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO.	0002	0002	0002	0004	0002	0004	0004	0004	0002	0002	0002	0002
	.00	.00	24.	.030	.000	.039	.008	.002	291.	0.	0.	0.0

00

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.08		.004	.018		0.22 □	.022	0.1	.004	114.	.021	0.47	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	29.	.058	.000	.122	.024	.004	403.	L 5.	0.	0.0

* *

0005 628636070830 PLATTE COUNTY WATER DISTRICT #4 BOX 129 PLATTE CITY, MISSOURI 64079

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628636070830	904	1	1	000	000	00	00	000	00	00	000	000	0	0	0	004	0	3 WELLS	000.04

AVERAGE

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0001	0000	0004	0004	0000	0004	0004	0001	0001	0001	0004	0001	0001	NO.
.07		.001	.000		0.22 □	.027	44.	.003	27.	.050	0.08	3.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO.	0001	0001	0001	0004	0001	0004	0004	0004	0001	0001	0001	0003
	.00	.00	7.2	.148	.000	.017	.002	.002	368.	0.	0.	0.0

00

MAXIMUM

ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.07		.002	.000		0.28 □	.052	44.	.003	27.	.074	0.08	3.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	7.2	.368	.000	.020	.004	.007	368.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

UNITS ARE MG/L EXCEPT: RADIATION IN PC/L, COLIFORMS PER 100/ML, TURB, AND COLOR IN STD. UNITS

0003 628636080830 PLATTE COUNTY WATER DIST. NO.5 BOX 5 WALDRON, MISSOURI 64092

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628636080830	1500	1	1		020	01	00	002	10	40	004	001	0	0	0	001	0	2 WELLS	000.04

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0002	0002	0000	0002	0002	0001	0001	0001	0002	0001	0001	NO.
	.05		.002	.005		0.28 □	.081 **	0.0	.002	59.	.036	0.70	5.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0002	0001	0002	0002	0002	0001	0001	0001	0001	01
	.00	.00	14.	.085	.000	.159	.010	.001	456.	0.	0.	0.0	

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
							1							
	.05		.003	.010		0.28 □	.152 **	0.0	.002	59.	.036	0.70	5.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	14.	.121	.000	.238	.011	.002	456.	L 5.	0.	0.0	

* *

0002 628636090830 PLATTE COUNTY WATER DISTRICT #6 RT. 27 PARKVILLE, MISSOURI 64152

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628636090830	800	8	1	000	000	00	00	000	00	00	000	000	0	0	0	000	0	/MISSOURI CITY/ 628538800240	000.13

AVERAGE

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0000	0000	0002	0002	0000	0002	0002	0000	0000	0000	0002	0000	0000	NO.
			.001	.000		0.21 □	.010				.026			

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0000	0000	0000	0002	0000	0002	0002	0002	0000	0000	0000	0002	00
				.040		.185	.002	.001				0.0	

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
			.001	.000		0.22 □	.010				.039			

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
				.063		.218	.004	.002				0.0	

* EXCEEDS RECOMMENDED STANDARDS. ** EXCEEDS MANDATORY STANDARDS. □ LESS THAN OPTIMUM CONCENTRATION OF F.

1222

0704 6Z8637800190 PLEASANT HILL MUNICIPAL WATER PLANT PLEASANT HILL, MISSOURI 64080

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628637800190	3700	4	1	000	011	00	00	200	04	01	004	001	0	0	0	001	0	BIG CREEK RIVER AND 100 ACRE IMP	000.95

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0001	0003 □	0003	0001	0001	0001	0003	0001	0001	AVERAGE NO.
	.05		.001	.003	.183	0.15	.018	10.	.005	91.	.017	1.00	8.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	17.	.036	.000	.022	.003	.000	322.	0.	2.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM EXCD														MAXIMUM
	.05		.002	.009	.183	0.16 □	.020	10.	.005	91.	.019	1.00	8.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	17.	.042	.000	.031	.006	.002	322.	L 5.	2.	0.0

* *

0704 6Z8667200190 RAYMORE MUNICIPAL WATER SUPPLY RAYMORE, MISSOURI 64083

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628667800190	400	4	1	000	011	00	00	023	00	40	004	001	0	0	0	001	0	IMPOUNDMENT	000.03

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0004	0004	0001 *	0003 □	0004	0001	0001	0001	0004	0001	0001	AVERAGE NO.
	.05		.001	.002	.343	0.30	.017	1.1	.009	54.	.020	0.27	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0004	0001	0003	0003	0004	0001	0001	0001	0002	01
	.00	.00	17.	.053	.000	.040	.012	.001	233.	0.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM EXCD					1 *									MAXIMUM
	.05		.003	.008	.343	0.33 □	.025	1.1	.009	54.	.033	0.27	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	.00	17.	.076	.000	.070	.031	.005	233.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, □ LESS THAN OPTIMUM CONCENTRATION OF F.

0003 628667800480 RAYTOWN WATER CO. 9820 E. 63RD ST. RAYTOWN, MISSOURI 64130

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628667800480	18000	8	2	200	000	00	00	000	00	00	000	000	0	0	0	000	4	/KANSAS CITY/ 628421800480	001.50

AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	
.04		.000	.017	.065	0.28	.018	3.5	.008	160.	.017	0.52	6.	

AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO. 0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002
											00
.00	.00	18.	.030	.000	.033	.001	.002	351.	0.	0.	0.0

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.04		.001	.021	.065	0.29	.025	3.5	.008	160.	.033	0.52	6.	

AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD											
.06	L .100	18.	.043	.000	.048	.004	.004	351.	L 5.	0.	0.0

* *

0003 628678100190 RICHARDS-GEBAUR AIR FORCE BASE WATER SUPPLY RICHARDS-GEBAUR, MISSOURI 64030

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628678100190	10000	9	4	000	000	00	00	000	00	00	000	000	0	0	2	000	4	/KANSAS CITY/ 628421800480	000.82

AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE NO.
0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	
.04		.000	.010	.065	0.27	.021	3.5	.008	160.	.019	0.52	6.	

AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
NO. 0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002
											00
.00	.00	18.	.050	.000	.034	.001	.002	351.	0.	0.	0.0

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.04		.001	.022	.065	0.29	.045	3.5	.008	160.	.033	0.52	6.	

AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD											
.08	L .100	18.	.069	.000	.048	.004	.004	351.	L 5.	0.	0.0

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

0004 628744600240 SMITHVILLE WATER DEPT. SMITHVILLE, MISSOURI 64080

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628744600240	1800	4	1		011	00	00	002	00	40	004	001	0	0	0	001	C	LITTLE PLATTE RIVER	000.11

	AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0003	0003	0001	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.03		.001	.006	.106	0.27 ¤	.023	0.3	.004	90.	.018	0.58	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	11.	.045	.000	.028	.010	.001	305.	0.	0.	0.0	

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	.03		.002	.020	.106	0.29 ¤	.031	0.3	.004	90.	.025	0.58	9.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	.00	L .100	11.	.066	.000	.037	.023	.004	305.	L 5.	0.	0.0	

* *

0003 628770500480 SUGAR CREEK WATER DEPT. SUGAR CREEK, MISSOURI 64054

ID NO	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
628770500480	4000	8	1		000	00	00	000	00	00	000	000	0	0	0	000	4	/INDEPENDENCE/ 628402600480	000.32

	AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0000	0001	NO.
	.00		.000	.006		0.25 ¤	.015	0.0	.000	100.	.009		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0000	0001	0003	0001	0003	0003	0003	0001	0001	0001	0003	00
	.00		25.	.030	.000	.006	.000	.002	318.	3.	0.	0.0	

	MAXIMUM ABS	BA	CD	CR	CCE	F	PB	MAXIMUM NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
	L .050		.002	.020		0.27 ¤	.019	L .4	L .002	100.	.010		6.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	EXCD
	L .010		25.	.055	L .004	.009	.001	.004	918.	3.	0.	0.0	

* EXCEEDS RECOMMENDED STANDARDS, ** EXCEEDS MANDATORY STANDARDS, ¤ LESS THAN OPTIMUM CONCENTRATION OF F.

0704 6287914008300 TRACY MUNICIPAL WATER SUPPLY TRACY, MISSOURI 64091

ID NO	POP	T	C	IMP	COA	CCR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY	AV DAY
6287914008300	240	1	1		020	00	00	000	04	00	020	000	0	0	0	004	0	1 WELL	

AVERAGE ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	AVERAGE
0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
.05		.002	.031		0.21 □	.036	0.4	.002	79.	.091	0.16	5.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NO.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	
	.00	.00	16.	.094	.000	.204	.013	.006	502. *	0.	0.	0.0	01

MAXIMUM ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	MAXIMUM EXCD
.05		.003	.041		0.21 □	.038	0.4	.002	79.	.178	0.16	5.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD						1			1			
	.00	.00	16.	.188	.000	.375 *	.026	.007	502. *	L 5.	0.	0.0

* * * \

0C03 628832500830 WEATHERBY LAKE MUNICIPAL WATER SYSTEM, ROUTE 22 PARKVILLE, MISSOURI 64497

ID NC	POP	T	C	IMP	COA	COR	TO	MIX	AER	SED	FIT	FIM	AM	RC	FL	DIS	CL	SOURCE OF SUPPLY		AV DAY
628832800830	756	8	1	000	000	00	00	000	00	00	000	000	0	0	0	000	4	/PARKVILLE/	628614450830	000.04

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
AVERAGE	0001	0000	0003	0003	0000	0003	0003	0001	0001	0001	0003	0001	0001	NO.
	.04		.001	.000		0.21 □	.016	0.1	.004	114.	.060	0.47	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI	
NC.	0001	0001	0001	0003	0001	0003	0003	0003	0001	0001	0001	0002	00
	.00	.00	29.	.056	.000	.104	.010	.000	403.	0.	0.	0.0	

	ABS	BA	CD	CR	CCE	F	PB	NO3	SE	SO4	ZN	TURB	BETA	
MAXIMUM							MAXIMUM							MAXIMUM
EXCD														
	.04		.004	.000		0.22 □	.022	0.1	.004	114.	.090	0.47	7.	

	AS	B	CL	CU	CN	FE	MN	AG	TDS	COLOR	ALPHA	COLI
EXCD												
	.00	L .100	29.	.096	.000	.176	.024	.000	403.	L 5.	0.	0.0

* * * \

APPENDIX C

FORMS USED TO GATHER DATA

FCA-18 (CIN)
(2-69)

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Consumer Protection and Environmental Health Service
Environmental Control Administration
Bureau of Water Hygiene

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INVENTORY OF MUNICIPAL WATER FACILITIES

LATEST DATA IN PHS FILES | CURRENT DATA

STATE

COMMUNITY	POPULATION: ESTIMATED POPULATION SERVED	YEAR OPER. STARTED: PRESENT SUPPLY	PRESENT TREATMENT PLANT	OWNERSHIP
1	2	3		4

COMMUNITY OR FACILITY LOCATION (1) a: Correct legal name

Postal address of utility

COUNTY (1) b

1960 CENSUS POPULATION (2) a

CURRENT ESTIMATED POPULATION SERVED (2) b

LAB. CONTROL (3)

OWNERSHIP (4)

NUMBER OF SERVICES / NUMBER OF METERS	LAB. CONTROL	SOURCE OF SUPPLY	SAFE YIELD IMPOUNDED MG / MAXIMUM DEPEND. DRAFT (GR. WATER) MG
5	6	7	8

(5) CLASSIFICATION	NUMBER OF SERVICES	NUMBER OF METERS	MGD AVG. WATER
RESIDENTIAL a			
COMMERCIAL b			
INDUSTRIAL c			
PUBLIC d			
TOTAL e			

SOURCE OF SUPPLY (6)

SAFE YIELD IMPOUNDED MG (7) a

MAXIMUM DEPENDABLE DRAFT (GR. WATER) MG (7) b

RATED PLANT CAPACITY MGD / AVERAGE PLANT OUTPUT MGD	TREATMENT	DISTRIBUTION STORAGE: PUMPED TO MAINS	IMPROVEMENTS NEEDED
9	10	11	12

RATED CAPACITY MGD (8) a / AVERAGE (8) b OUTPUT MGD / EMERGENCY POWER (8) c	TREATMENT (9) a	DIST. STORAGE: PUMPED TO MAINS MG (10) a / GRAVITY TO MAINS MG (10) b	IMPROVEMENTS NEEDED (11)

REMARKS

FORM APPROVED
BUDGET BUREAU NO.

PHS USE

1294

MUNICIPAL WATER SUPPLY SANITARY SURVEY 130<

BOB #85-S69004
Exp. March 1970

1. Leave this blank (for office use only) (DUP. ON EVERY CARD) SURVEY DATE Date of your visit (mo. day yr.)

2. Name of supply Same as on inventory

3. Location Same as on inventory
post office common name, if different

4. Demands, MGD:

	PRESENT	10-YR. ESTIMATE	UNKNOWN
A. Avg. day	From		
B. Max. day	Plant		
C. Max. month	Records		

5. Water use has been restricted [ ] times for a total of [ ] days during any one year of the past 5 years.

6. LABORATORY CONTROL

A. Bacteriological (Distribution system only)

(1) Min. number samples recommended per month by PHS DWS → From Fig 1- D.W.S. UNKNOWN

(2) Avg. number/month for last 12 months

(3) Range of least and most monthly samples from May be zero to

(4) Number of months the Drinking Water Standards were not met during the last 12 months for: No. of months UNKNOWN

(a) Quality — Sec 3.2 - D.W.S.

(b) Number of samples { Months when sample numbers < no. in 6.A.(1)

(c) NONE collected No samples for ___ months.

From plant records

(5) Are samples representative of distribution system? Judge from map of distribution system. yes no

(6) Are check samples collected as provided for in the Drinking Water Standards? Sec 3.15 - D.W.S. yes no

(7) Are samples requiring check samples reported by telephone? yes no

(8) Is the laboratory certified? yes no

(a) Within the past 2 years? yes no

(b) If answer to one or both, by whom was it certified. State PHS

Information from operator

(9) Are samples received by lab within 30 hours? yes no

ECA-19

B. Chemical (finished water only)

B(1)-(4) refer to Sec 5.2-DWS

(1) Samples of finished water are analyzed each ☐ month, ☐ year, ☐ 2 years, ☐ 3 years, ☐ infrequently ☐ never.

(2) Type of analysis: ☐ everything complete (DWS) ☐ partial. If any constituents missing

(3) Date of last chemical analysis ☐☐ mo. ☐☐ day ☐☐ yr

(4) Analyzed by ☐ utility, ☐ state, ☐ PHS, ☐ university, ☐ other.

(5) Tests run for operational control and their frequency are:

Tests	Frequency				
	Continuous	Each shift	Daily	Weekly	Less frequently than weekly
Alkalinity	☐	☐	☐	☐	☐
Aluminum	☐	☐	☐	☐	☐
Chloride	☐	☐	☐	☐	☐
Chlorine residual	☐	☐	☐	☐	☐
Color	☐	☐	☐	☐	☐
Fluoride	☐	☐	☐	☐	☐
Hardness	☐	☐	☐	☐	☐
Iron	☐	☐	☐	☐	☐
Jar tests	☐	☐	☐	☐	☐
Manganese	☐	☐	☐	☐	☐
pH	☐	☐	☐	☐	☐
Taste & Odor	☐	☐	☐	☐	☐
Turbidity	☐	☐	☐	☐	☐
Zeta potential	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐

Note other frequencies

(END CARD TWO) [2] 80

C. Radioactivity

(1) Samples are analyzed each ☐ month, ☐ year, ☐ 2 years, ☐ 3 years, ☐ infrequently ☐ never. (END CARD 3) [3] 80

(2) Date of last radiological analysis ☐☐ mo. ☐☐ day ☐☐ yr

(3) Analyzed by ☐ utility, ☐ state, ☐ PHS, ☐ university, ☐ other. (specify)

7. SANITARY SURVEY

A. Date of most recent survey [ ][ ] mo. [ ][ ] day [ ][ ] yr. 29 By others - Not of this one

B. Survey made by: [ ] 31 state, [ ] 32 PHS, [ ] 33 local health department, [ ] 34 utility, [ ] 35 consultant. "Survey" requires written report of findings

C. Facilities surveyed: [ ] 36 source, [ ] 37 transmission, [ ] 38 treatment, [ ] 39 storage, [ ] 40 distribution.

8. FACILITIES & OPERATION (describe deficiencies on reverse side)

	YES	NO
A. Are there common walls between finished and lesser quality water?	[ ] 41	[ ] 42
B. Are there inter-connections to other "systems" {Sub-divisions, private industrial, community indicated by state health dept acceptance.	[ ] 43	[ ] 44
(1) of known acceptable quality		
(2) of unknown quality		
(a) with protection Note how protected	[ ] 45	[ ] 46
(b) without protection	[ ] 47	[ ] 48
C. Is there a cross-connection control program		
(1) on new construction only	[ ] 49	[ ] 50
(2) for continuous re-inspection	[ ] 51	[ ] 52
D. Are finished water reservoirs properly covered?	[ ] 53	[ ] 54
E. Is there detectable chlorine residual in distant parts of the distribution system?	[ ] 55	[ ] 56
F. Can the treatment plant be by-passed?	[ ] 57	[ ] 58
G. Are there satisfactory procedures to:		
(1) prevent personal accidents	[ ] 59	[ ] 60
(2) prevent chlorine accidents	[ ] 61	[ ] 62
(3) disinfect all new and/or repaired distribution system mains, valves, fittings, including check samples before being placed in service?	[ ] 63	[ ] 64
H. Are there areas of low pressure (< 20 psi) in the distribution system under maximum water use?	[ ] 65	[ ] 66

I. Operating problems most often encountered are: [ ] 67 taste & odor [ ] 68 phenols, [ ] 69 corrosive water, [ ] 70 short filter runs, [ ] 71 other, specify.

8. FACILITIES & OPERATION, continued

J. Chlorination process was interrupted [ ][ ] (72 73) times in the last 12 months.

(1) Interruptions were due to: [ ] (74) chlorinator failure, [ ] (75) feedwater pump, [ ] (76) changing cylinders, [ ] (77) power failure, [ ] (78) other, explain. (END CARD 4) [4] (80)

K. Percent of land area within service area where water is available (nearest whole percent) [ ][ ][ ] (13 15) %.

L. Were plans and specs. for treatment plant approved by the state? YES [ ] (16) NO [ ] (17)

9. SOURCE, TREATMENT & DISTRIBUTION (describe deficiencies on reverse side) Note

A. Are the following adequate:

	YES	NO
(1) Source, with respect to the following:		
(a) quantity	[ ] (18)	[ ] (19)
(b) bacteriological quality } Refer to PHS No. 1820	[ ] (20)	[ ] (21)
(c) chemical quality } Refer to PHS No. 1820	[ ] (22)	[ ] (23)
(d) physical quality } Refer to PHS No. 1820	[ ] (24)	[ ] (25)
(e) adequate protection	[ ] (26)	[ ] (27)
(2) Transmission of raw water	[ ] (28)	[ ] (29)
(3) Is the raw water sampled for:		
(a) Bacteriological contamination	[ ] (30)	[ ] (31)
(b) Chemical contamination	[ ] (32)	[ ] (33)
(4) Treatment, with respect to the folowing:		
(a) aeration	[ ] (34)	[ ] (35)
(b) chemical feed, capacity	[ ] (36)	[ ] (37)
(c) chemical feed, stand-by equipment	[ ] (38)	[ ] (39)
(d) chemical mixing	[ ] (40)	[ ] (41)
(e) flocculation	[ ] (42)	[ ] (43)

9. SOURCE, TREATMENT & DISTRIBUTION, continued

A. Are the following adequate (continued):

	YES	NO
(4) Treatment, continued:		
(f) settling	44	45
(g) recarbonation	46	47
(h) filtration At normal operating rates	48	49
(i) disinfection, capacity	50	51
(j) disinfection, stand-by equipment	52	53
(k) taste & odor control	54	55
(l) fluoridation	56	57
(5) Distribution, with respect to the following:		
(a) storage	58	59
(b) booster chlorination	60	61
(c) high service pumping	62	63
(d) booster pumping	64	65
(e) pressure	66	67
(6) Maintenance	68	69
(7) Records for:		
(a) disinfection	70	71
(b) filter runs	72	73
(c) chemical consumption	74	75
(d) operational control tests	76	77
(e) bacteriological examinations	78	79
(8) Cross-connection control	END CARD 5	5 80
(a) ordinance	15	16
(b) program implementation	15	16
(c) progress	17	18

9. SOURCE, TREATMENT & DISTRIBUTION, continued

B. During the past 3 years, raw water quality has [ ]19 improved, [ ]20 deteriorated, or [ ]21 stayed the same.

10. PERSONNEL

A. Water Purification Operator

This is the responsible plant operator - Not supt.

(1) Highest level of formal education: [ ]22 8th grade or less, [ ]23 high school, [ ]24 technical or trade school, [ ]25 university.

(2) Level of training in water treatment: [ ]26 college course, [ ]27 technical or trade school, [ ]28 short school, [ ]29 on the job, [ ]30 none, [ ]31 other, specify _____.

(3) Length of time on this job: [ ][ ]32 33 years, [ ][ ]34 35 months.

(4) Number of previous positions as water treatment operator [ ][ ]36 37

(5) Total years of water purification experience [ ][ ]38 39

(6) Level of study in sanitary microbiology: [ ]40 college course, [ ]41 technical or trade school, [ ]42 short school, [ ]43 on the job, [ ]44 none, [ ]45 other, specify _____.

(7) Level of study in water chemistry: [ ]46 college course, [ ]47 technical or trade school, [ ]48 short school, [ ]49 on the job, [ ]50 none, [ ]51 other, specify. _____.

(8) Is the operator a full-time employee? [ ]52 yes [ ]53 no

(9) Salary range (per year) of operator: [ ]54 <$1,999 [ ]55 $2,000-4,999 [ ]56 $5,000-7,499 [ ]57 $7,500-9,999 [ ]58 $10,000

Get operator data for each supply even if there is no treatment.

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10. PERSONNEL, continued

A. continued

(10) Is your present staff adequate in: Operator's opinion

(a) number ☐ yes (60) ☐ no (61)

(b) quality ☐ yes (62) ☐ no (63)

B. Operator's major complaint _____

C. Most frequent customer's complaint: Received by utility.

D. Management's most frequent complaint: _____

11. FINANCIAL INFORMATION

A. Bonded indebtedness: (water supply)

(1) General obligation bonds $ [ ] . END CARD 6 [6] 80

(a) statutory limit $ [ ] .

(2) Revenue bonds $ [ ] .

(a) statutory limit $ [ ] .

B. Capital stock, par value $ [ ] .

bonds, par value $ [ ] .

C. Water funds are [ ] kept separate or [ ] mingled with other funds.

D. Is there an annual payment to the general fund? [ ] yes [ ] no

E. Operation is controlled by: [ ] mayor-council, [ ] mayor-commission, [ ] independent water board, [ ] other, specify. _____ .

For city, district, etc owned only

F. Is there active planning for expansion or improvement? [ ] yes [ ] no

(1) Value of planned improvement $ [ ] .

(2) Planning by utility [ ] yes [ ] no

(3) Planning by consultants [ ] yes [ ] no

utility only

utility & consultants

END CARD 7 [7] 80

G. If expansion is planned, it will be carried out within:

	1 YR.	2-5 YRS.	6-10 YRS.
(1) Source	[ ]	[ ]	[ ]
(2) Treatment	[ ]	[ ]	[ ]
(3) Distribution	[ ]	[ ]	[ ]
(4) Other _____	[ ]	[ ]	[ ]

H. Costs of production:

CENTS/1,000 GALLONS

(1) Chemicals [ ] [ ] . [ ]

(2) Labor, power, etc. [ ] [ ] . [ ]

(3) Depreciation [ ] [ ] . [ ]

(4) Other, including office, administration, meter reading, collection, etc. [ ] [ ] . [ ]

(5) Total [ ] [ ] . [ ]

FINANCIAL INFORMATION, continued

1. Tariff (Residential)

(1) Connection fee $ [41][42][43][44].

(2) Sales unit is [45] per 1,000 gallons or [46] per 100 cu. ft.

(a) [47][48][49] cents for the first [50][51] units

(b) [52][53][54] cents for the next [55][56] units

(c) [57][58][59] cents for the next [60][61] units

(d) etc. as needed to cover steps.

Adjust all rates to these units.

END CARD 8 [8] [80]

Note flat rate here as $/time unit.

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ENVIRONMENTAL CONTROL ADMINISTRATION

BUREAU OF WATER HYGIENE

Reproduced from best available copy.

PUNCH IN COLS. 9 11

IDENTIFICATION OF WATER SAMPLE

1. LOCATION OF WATER SUPPLY Same as on inventory
CITY, COUNTY, STATE

FOR OFFICE USE ONLY [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
7 17

2. WATER SUPPLY NAME Same as on inventory

3. DATE OF SAMPLING
BEGINNING DATE OF COMPOSITE MO. [ ][ ] DAY [ ][ ] 19 22
ENDING DATE OF COMPOSITE OR DATE OF GRAB SAMPLE MO. [ ][ ] DAY [ ][ ] YR. [ ][ ] 23 28

4. SAMPLE FROM [ ] TREATMENT PLANT (2) [ ] WELL (4) [ ] RESERVOIR (7) [ ] DISTRIBUTION SYSTEM (1) [ ] OTHER (9) [ ] (1)

5. SAMPLING POINT LOCATION AND OR DESCRIPTION ie. kitchen, 1234 Main [ ][ ]

6. TYPE OF WATER SAMPLED [ ] FINISHED (5) [ ] PARTIALLY TREATED (4) [ ] RAW (2) [ ] OTHER (0) [ ] (1)

7. SOURCE OF WATER [ ] SURFACE (8) [ ] GROUND (5) [ ] COMBINED (2) [ ] OTHER (0) [ ]

8. SAMPLING METHOD [ ] COMPOSITE (6) [ ] GRAB (4) [ ] OTHER (0) [ ]

9. ANALYSIS REQUIRED [ ] ORGANIC (5) [ ] TRACE ELEMENTS (4) [ ] WET (2) [ ] RADIO-CHEMICAL (1) [ ] OTHER (3) [ ] 29

10. WATER SUPPLY CATEGORY [ ] COMMUNITY WATER SUPPLY (8) [ ] NCWS (4) [ ] FEDERAL INSTALLATION (2) [ ] SPECIAL STUDY (1) [ ] OTHER (0) [ ][ ] 30 31

11. APPEARANCE OF SAMPLE _____

12. ADDITIONAL REMARKS _____

13. COLLECTED BY _____ [ ] U.S. PHS VESSEL [ ] OTHER [ ] 32

DO NOT WRITE BELOW THIS LINE

LAB. SAMPLE NO. _____ DATE RECEIVED _____

LABORATORY REMARKS

OVER FOR INSTRUCTIONS

INSTRUCTIONS: EVERY ITEM OF INFORMATION REQUIRED FROM THE SAMPLER IS NUMBERED (1 THROUGH 13). THESE ARE THE ONLY RESPONSES THE SAMPLER SHOULD MAKE. NOTE AREAS MARKED "DO NOT WRITE BELOW THIS LINE" AND "FOR OFFICE USE ONLY."

ITEM 1 SHOULD BE THE LOCATION OF THE WATER SUPPLY FACILITY WHICH PRODUCED THE WATER FOR THE SAMPLE. (EXAMPLE: CINCINNATI, HAMILTON, OHIO.)

ITEM 2 SHOULD BE THE FULL NAME OF THE WATER SUPPLY FACILITY. (EXAMPLE: CINCINNATI MUNICIPAL WATER WORKS)

ITEMS 4, 6, 7, AND 8 - CHECK THE BOX WHICH APPLIES

ITEMS 9 AND 10 - CHECK ONE OR MORE BOXES AS NECESSARY

ITEMS 3, 5, 11, 12, AND 13 SHOULD BE SELF-EXPLANATORY

ANY RESPONSE OF "OTHER" OR "SPECIAL STUDY" SHOULD BE EXPLAINED UNDER ITEM 12 - ADDITIONAL REMARKS.

IF NECESSARY FOR COMPLETE IDENTIFICATION OR EXPLANATION, PLEASE FEEL FREE TO USE THE BACK OF THE ORIGINAL (WHITE) COPY OR ATTACH AN ADDITIONAL PAGE OF LIKE SIZE.

DISTRIBUTION:

MAIL ORIGINAL (WHITE COPY) TO:

WATER QUALITY REGISTER BRANCH
BUREAU OF WATER HYGIENE
222 E. CENTRAL PARKWAY
CINCINNATI, OHIO 45202

BLUE	ENCLOSED WITH ORGANIC SAMPLE
PINK	ENCLOSED WITH TRACE METAL SAMPLE
YELLOW	ENCLOSED WITH WET CHEMISTRY SAMPLE
GREEN	ENCLOSED WITH RADIOCHEMICAL SAMPLE
TAN	RETAINED BY REGIONAL OFFICE OR SAMPLER

REPORT OF WATER SUPPLY USED ON INTERSTATE CARRIERS

FOR USE OF PHS REGIONAL OFFICE

(Location code)

1. NAME OF WATER SUPPLY FACILITY

LOCATION (City, County, State)

2. WATER SUPPLY OFFICIAL CONTACTED (Name and Title)

3. DATE THIS SURVEY MADE — MO. DAY YR.

4. DATE OF LAST PHS - STATE JOINT SURVEY — MO. DAY YR.

5. POPULATION SERVED BY DISTRIBUTION SYSTEM (To the nearest hundred) •

6. OWNERSHIP
1 = Public
2 = Private

7. SOURCE
1 = Surface
2 = Ground
3 = Combination

8. TREATMENT USED -- 1 = YES, 2 = NO

- Disinfection
- Coagulation
- Rapid Sand Filtration
- Fluoridation
- Taste and Odor Control
- Lime Softening
- Ion Exchange
- Settling
- Iron Removal
- Other (If yes describe under 13).

9. LOCAL WATER SUPPLY PROGRAM -- 1 = YES, 2 = NO

A. Is there a continuous program, such as a cross-connection survey, to detect health hazards and sanitary defects within the water distribution system?

B. If there is a program such as described in "A" above are sanitary defects and health hazards being removed systematically and at a rate which is satisfactory?

C. Does the community have an adequate plumbing code, such as the National Plumbing Code, or are there rules and regulations prohibiting connections or arrangements by which liquids, steams, gasses, or chemicals of unsafe, unknown, or questionable quality may be discharged or drawn into the public water supply?

D. Are there provisions to enforce such code or rules and regulations on new construction?

-- on major repairs and reconstruction?

E. Are the principal plant operators certified or licensed under a state program?

-- is such certification or licensing compulsory?

CHEMICAL ANALYSIS (mg./l) (A blank indicates no report)

10. Date last chemical sample taken — MO. DAY YR.
How often are chemical analyses made?

- Alkalinity (as $Ca CO_3$)
- Arsenic (.05)**(.01)*
- Barium (1.0)*
- Cadmium (.01)**
- Chromium Hexavalent (.05)**
- Cyanide (.2)** (.01)*
- Fluoride
- Lead (.05)**
- Hardness (as $Ca CO_3$)
- Selenium (.01)**
- Silver (.05)**
- ABS (.5)*
- Chloride (250)*
- Copper (1.0)*
- CCE (.2)*
- Iron (.3)*
- Manganese (.05)*
- Nitrate (NO_3) (45)*
- Phenols (.001)*
- Sulfates (250)*
- TDS (500)*
- Zinc (5.0)*
- pH
- Magnesium

*RECOMMENDED MAXIMUM **MAXIMUM CHEMICAL LIMITS --MG/L

PHYSICAL AND RADIOCHEMICAL ANALYSIS

11. How often are physical analyses made?

PHYSICAL

- Turbidity (5 s.u.)
- Color (15 s.u.)
- Odor (3 s.u.)
- Avg. Water Temp. (°F)
- Avg. Air Temp. (°F)(2)

RADIOCHEMICAL

- SR^{90} (10 μμc/1)*
- RA^{226} (3 μμc/1)*
- GROSS BETA (1000 μμc/1)*
- GROSS ALPHA
- SR^{89}
- I^{131}

* Limits from 1962 PHS Drinking Water Standards

BACTERIOLOGICAL EXAMINATIONS

12. ☐☐☐☐ Minimum number of samples required per month①

LABORATORIES	DATES OF MOST RECENT LABORATORY CERTIFICATIONS
NAMES OF LABORATORY CERTIFYING AUTHORITIES	

MONTH AND YEAR		NUMBER OF SAMPLES	TUBE METHOD ☐ 10 ML. OR ☐ 100 ML. STANDARD PORTIONS					MEMBRANE FILTER METHOD				
			NUMBER	NUMBER POSITIVE ②	% POSITIVE ③	SAMPLES HAVING 3 OR MORE 10 ML. OR 5 100 ML. PORTIONS POSITIVE ④		MONTH AND YEAR	NUMBER OF SAMPLES	MEAN COLIFORM DENSITY PER 100 ML. ⑤	SAMPLES HAVING COLIFORM DENSITIES EXCEEDING 3/50, 4/100, 7/200, 13/500 MLS. ⑥	
MO.	YR.					NUMBER	% POSITIVE	MO.	YR.			NUMBER	% POSITIVE

Footnotes:

1. See Figure 1 PHS Drinking Water Standards (1962)
2. Any member of the coliform group of bacteria.
3. Should not exceed 10% per month, if 10 ml. portions are used, or 60% if 100 ml. portions are used.
4. If 10 ml. portions are used, should not exceed 5% in 20 or more samples per month nor one sample in less than 20 per month; if 100 ml. portions are used, should not exceed 20% in 5 or more samples per month nor one sample in less than 5 per month.
5. The arithmetic means density of all standard samples per month shall not exceed 1 per 100 ml.
6. Should not exceed 5% in 20 or more samples per month, nor 1 sample in less than 20 per month.
7. Maximum daily air temperature average for at least 5 years.

13. COMMENTS: *(Use additional sheet if necessary. Furnish complete description every three years)*

REVIEWING ENGINEER *(Name and Title)*	AGENCY
CLASSIFICATION RECOMMENDED 1–Approved 2–Provisionally Approved 3–Prohibited ☐	EXPIRATION DATE *(If provisionally approved)* ☐☐ MO. ☐☐ DAY ☐☐ YR.
DATE OF REVIEW ☐☐ MO. ☐☐ DAY ☐☐ YR.	SIGNATURE OF STATE HEALTH OFFICIAL
	TITLE IF OTHER THAN REVIEWER

PHS-682 (BACK)
REV. 10-64

HEW-Lex

STATE BACTERIOLOGICAL SAMPLING PROGRAMS

Kansas

Ground water (well) supplies:

All samples are collected from the distribution system and the number of samples are based on the 1962 Public Health Service Drinking Water Standards.

Surface water supplies:

1. As a minimum requirement , 2 samples per week are collected from the distribution system except every third week when 4 samples are collected which include 1 raw water, 1 filter effluent, 1 finished water at a plant tap, and 1 distribution system sample.

2. The 1962 Public Health Service Drinking Water Standards are used to determine the number of samples required for the larger supplies.

3. When the yearly number of samples reaches 208 (4 per week), all samples are collected from the distribution system and none from the treatment plant.

4. The maximum number of samples run by the State is 416 per year (8 per week).

5. All supplies requiring more than 416 samples a year have their own laboratory to run those samples required above the 416 level.

Rural water districts:

If the district buys their water from another supply and has no sampling program, the purveyor is requested to collect an occasional sample from the district's system. The evaluation of the district's bacteriological record is based on the purveyor's record. All other districts have the same requirements as municipal water supplies.

The laboratory discards all bacteriological samples that have been in transit more than 48 hours.

Missouri

Ground water (well) supplies:

Well supplies that do not require treatment must submit a minimum of 4 samples each month for bacteriological analyses.

Supplies serving a population over 2,600 must submit additional samples each month. For example, communities with a population of 6,000 submit 7 samples a month.

Water supplies requiring treatment:

Water supplies requiring treatment must submit a minimum of 4 samples per week for analysis. Those supplies serving a population above 13,000 must submit additional samples each week.